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FLORIGRAPHIA BRITANNICA.

FLORIGRAPHIA BRITANNICA;

OR,

ENGRAVINGS AND DESCRIPTIONS

OF THE

FLOWERING PLANTS AND FERNS

OF BRITAIN.

BY

RICHARD DEAKIN, M.D.,

AUTHOR OF "THE FLORA OF THE COLOSSEUM OF ROME," ETC.

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September 15, 1922

SYNOPSIS OF THE GENERA.

CLASS 16. MONADELPHIA.

(*Filaments combined in one set*).

ORDER I. PENTANDRIA.—5 perfect Stamens.

1. ERO'DIUM, [Page 931.] *Calyx* of five pieces. *Petals* five. *Stamens* ten, five alternately imperfect, with a *gland* at the base of each. *Fruit* beaked. *Capsules* five, each with a long spirally twisted awn, bearded on the inner side.—*Herbaceous plants, with pinnated or lobed leaves, and peduncles mostly bearing several flowers.*
-

ORDER II. DECANDRIA.—10 Stamens.

2. GERANIUM, [Page 933.] *Calyx* of five pieces, *Stamens* ten, alternately larger, each of the larger ones bearing a *gland* at the base. *Fruit* beaked. *Capsules* five, each with a long naked awn, curling back from the base to the point.—*Herbaceous plants, with palmate leaves and peduncles, one or two flowered.*
-

ORDER III. POLYANDRIA.—Many Stamens.

3. LAVATERA, [Page 943.] *Calyx* surrounded by an *involucrum*, from three to six lobed. *Fruit* of numerous one seeded *capsules*, arranged in a circle round a common axis.
4. MALVA, [Page 944.] *Calyx* surrounded by a three leaved *involucrum*. *Fruit* of numerous one seeded *capsules*, arranged in a circle round a common axis.
5. ALTHÆA, [Page 946.] *Calyx* surrounded by an *involucrum*, of from six to nine pieces. *Fruit* of numerous one

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seeded *capsules*, arranged in a circle round a common axis, in a fine lobed head.

CLASS 17. DIADELPHIA.

(*Filaments combined in two sets*), except in the first division of the 3rd Order.

ORDER I. HEXANDRIA.—6 *Stamens*.

1. CORYDA'LIS, [Page 949.] *Calyx* of two small pieces, or wanting. *Petals* four, free or united, one of which is spurred at the base. *Silique* compressed, two valved, many seeded.
 2. FUMA'RIA, [Page 951.] *Calyx* of two pieces. *Petals* four, one of them spurred or gibbous at the base. *Silique* indehiscent, one seeded, nut-like. *Style* deciduous.
-

ORDER II. OCTANDRIA.—8 *Stamens*.

3. POLY'GALA, [Page 954.] *Calyx* of five pieces, persistent, the two inner ones usually larger winged and coloured. *Petals* three or five, attached by their claws to the tube of the filaments, the lower one keeled. *Capsules* compressed. *Seeds* downy, crested at the hilum.
-

ORDER III. DECANDRIA.—10 *Stamens*.

(*All belonging to the Natural Order Papilionaceæ*).

A. *Filaments all united at the base*.

1. *Calyx distinctly two lipped*.

4. U'LEX, [Page 955.] *Calyx* of two pieces, with a small scale on each side at the base, the upper lip with three and the lower with two teeth. *Stamens* monadelphous. *Legume* turgid, one celled, two valved, ovate-oblong, scarcely longer than the calyx.—*Branched spiny shrubs, with solitary yellow flowers*.
5. GENIS'TER, [Page 957.] *Calyx* two lipped, the upper lip in two deep segments, the lower three toothed, *keel* oblong, straight. *Stamens* monadelphous. *Style* subulate, ascending. *Legumes* flat, compressed, or rather turgid, many seeded.—*Shrubby plants, with yellow flowers*.

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6. CYTISUS, [Page 959.] *Calyx* two lipped, the upper lip mostly entire, the lower one slightly three toothed. *Vexillum* ovate, large, *keel* very blunt. *Stamens* monodelphous. *Legumes* compressed, flat, many seeded.—*Shrubs with yellow flowers and ternate leaves.*
2. *Calyx* five toothed, or indistinctly two lipped.
7. ONO'NIS, [Page 961.] *Calyx* cut into five linear teeth. *Vexillum* large, striated. *Stamens* monodelphous. *Legumes* turgid, sessile, few seeded.—*Herbaceous plants or undershrubs, with ternate leaves and yellow or purple axillary flowers.*
8. ANTHYL'IS, [Page 963.] *Calyx* tubular, five toothed, persistent, often inflated. *Petals* nearly all of an equal length. *Legumes* ovate, turgid, one to three seeded, enclosed in the calyx.—*Herbaceous plants or undershrubs, of various habits.*
B. *Filaments diadelphous, nine united, one free.*
1. *Style smooth.*
* *Legumes of two more or less complete longitudinal cells.*
9. ASTRA'GALUS, [Page 964.] *Calyx* five toothed. *Corolla* with an obtuse keel. *Stamens* diadelphous. *Legumes* more or less perfectly two celled, formed by the lower suture being turned inwards.—*Herbaceous plants or low shrubs, with pinnate leaves.*
10. OXY'TROPIS, [Page 966.] *Calyx* five toothed. *Corolla* with a pointed keel. *Stamens* diadelphous. *Legumes* more or less perfectly two celled, formed by the upper suture being turned inwards.—*Herbaceous plants, with pinnated leaves, flowers spicate, on axillary or radical peduncles.*
** *Legumes of one cell, one or many seeded.*
11. MELILO'TUS, [Page 968.] *Calyx* five toothed. *Keel* simple, *wings* shorter than the *vexillum*. *Stamens* diadelphous. *Legumes* oblong, or sub-globose, coriaceous, one or few seeded, indehiscent.—*Herbaceous plants, leaves ternate, with the stipules attached to the petioles, flowers yellow or white, in lax racemes.*
12. TRIFO'LIUM, [Page 970.] *Calyx* tubular, persistent, five-cleft or five-toothed. *Corolla* persistent. *Keel* obtuse shorter than both the *vexillum* and *wings*. *Stamens*

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diadelphous. *Legumes* ovate, indehiscent, one or two seeded, rarely oblong, and three or four seeded.—*Herbaceous plants, with ternate leaves and stipules, adhering to the petioles, flowers in crowded heads or spikes.*

13. TRIGON'ELLA, [Page 982.] *Calyx* campanulate, five-cleft. *Keel* very small, the wings and vexillum together imitating a tripetalous corolla. *Legume* oblong, compressed, or cylindrical, acuminate, nearly erect, many seeded.—*Herbaceous plants, mostly strong scented, leaflets three, the terminal one stalked.*

14. Lo'RUS, [Page 983.] *Calyx* tubular, five-cleft or five-toothed. *Corolla* with a beaked keel, and wings about as long again as the vexillum. *Stamens* diadelphous. *Legumes* cylindrical, or compressed, linear, somewhat spongy within, valves curved spirally on bursting. *Seeds* mostly numerous.—*Herbaceous plants, with ternate leaves and leafy stipules. Flowers one to six terminating axillary peduncles.*

15. MEDICA'GO, [Page 986.] *Calyx* five-cleft, or five-toothed. *Keel* obtuse. *Stamens* diadelphous. *Legumes* many seeded, variable in form, always falcate, or spirally twisted.—*Herbaceous plants or shrubs, stipules leafy, mostly cut, leaves ternate. Flowers one to many, on axillary peduncles, yellow or purple.*

*** *Legumes of one cell, or divided by transverse articulations, and separating at the joints.*

16. ONO'BRYCHIS, [Page 990.] *Calyx* five-cleft, equal. *Keel* obliquely truncated, wings short. *Stamens* diadelphous. *Legume* sessile, of one joint, indehiscent, coriaceous, compressed, one seeded, the upper margin thick and straight, the lower thinner, curved, toothed, spiny, or lobed.—*Herbaceous plants, bearing spikes of red or white flowers, on long peduncles.*

17. ORNI'THOPUS, [Page 992.] *Calyx* elongated, tubular, five-toothed, unequal. *Keel* short, compressed. *Stamens* diadelphous. *Legume* elongated, curved, compressed, contracted at the joints, each joint single seeded, and separating equally, truncate at each end.—*Hairy annuals, with pinnate leaves, having a small stipule, adhering to the petiole. Flowers small, few, terminating the axillary*

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peduncles, white or pink, and bearing a pinnated bractea under each head.

18. ASTROLO'BIIUM, [Page 992.] *Calyx* elongated, tubular, five-toothed, unequal. *Keel* short, compressed. *Stameas* diadelphous. *Legumes* elongated, curved, *cylindrical*, contracted at the joints, each joint single seeded, and separating, with cylindrical truncated ends.—*Herbaceous smooth plants, with pinnated leaves and small two toothed stipules. Flowers small, few, terminating the axillary peduncles, yellow, and without a bractea.*
19. HIPPO'CREPIS, [Page 993.] *Calyx* short, campanulate, five-toothed, bi-labiate. *Keel* acuminate, two lobed. *Stamens* diadelphous. *Legume* elongated, compressed, jointed, curved, the outer edge deeply notched. *Seeds* oblong, cylindrical, curved.—*Herbaceous plants or shrubs, with pinnated leaves, and yellow flowers, either axillary, solitary, and sessile, or in umbels at the end of an axillary peduncle.*
 2. *Style* downy beneath the stigma.
20. VI'CLA, [Page 994.] *Calyx* tubular, five-cleft or five-toothed, unequal. *Stamens* diadelphous. *Style* filiform, villous on the upper side, and with a tuft of hairs below the stigma on the under. *Legume* oblong, one celled, many seeded. *Seeds* with an oval or linear lateral hilum.—*Herbaceous climbing plants, with abruptly pinnate leaves, terminating in a tendril, peduncles axillary, short and one flowered, or long and many flowered.*
21. ER'VUM, [Page .] *Calyx* five-cleft or five-toothed. *Stamens* diadelphous. *Style* filiform. *Stigma* capitate, downy. *Legume* oblong, two to four seeded.
22. PI'SUM, [Page 1002.] *Calyx* of five foliaceous unequal segments. *Stamens* diadelphous. *Vexillum* large, reflexed. *Style* compressed, keeled, villous on the upper side. *Legume* of one cell, oblong, compressed, many seeded. *Seeds* roundish, with a roundish hilum.—*Annuals. Leaves abruptly pinnate, the leaflets in three pairs, the terminal one formed into a tendril, stipules large, leafy.*
23. LATHY'RUS, [Page 1003.] *Calyx* campanulate, its mouth oblique, unequally five-cleft. *Stamens* diadelphous

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Style linear, flat, dilated upwards, and downy in front. *Legumes* of one cell, oblong, many seeded. *Seeds* round, or angular.—*Climbing Herbaceous plants. Leaves abruptly pinnate, of from one to three pairs of leaflets, the terminal one formed into a tendril, stipules leafy, half sagittate.*

24. ORO'BUS, [Page 1007.] *Calyx* campanulate, its mouth oblique, unequally five-cleft, obtuse at the base. *Stamens* diadelphous. *Style* slender, linear, downy above. *Legumes* cylindrical, oblong, of one cell, many seeded. *Seeds* with a linear hilum.—*Erect herbaceous plants, leaves abruptly pinnate, with a short bristly point in the place of a terminal leaflet.*
-

CLASS 18. POLYADELPHIA.

(*Filaments combined in more than two sets.*)

ORDER I. POLYANDRIA.—*Many Stamens.*

1. ANDROSÆ'MUM, [Page 1010.] *Calyx* divided into five unequal pieces. *Petals* five. *Styles* three. *Stamens* numerous, united at the base. *Fruit* a pulpy one celled berry.—*Shrub with sessile leaves, and terminal stalked flowers.*
2. HYPERICUM, [Page 1011.] *Calyx* of five pieces, more or less united at the base. *Petals* five. *Styles* three to five. *Stamens* numerous, rarely few, united at the base. *Fruit* a membranous three celled capsule.—*Herbaceous plants or shrubs, with opposite leaves, often with pellucid dots or black dots on the margin. Flowers* yellow, or orange coloured.
-

CLASS 19. SYNGENESIA.

(*Anthers united into a tube. Flowers compound.*)

(*All the Natural Order COMPOSITEÆ, Juss.*)

ORDER I. POLYGANIA ÆQUALIS.

(*Florets all perfect.*)

1. *Florets all with ligulate or strap-shaped corollas.*
A. *Pappus* feathery, receptacle paleaceous.

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1. *HYPOCHÆ'ERIS*, [Page 1017.] *Involucrum* oblong, imbricated. *Receptacle* paleaceous, the scales deciduous. *Fruit* striated, more or less beaked. *Pappus* feathery.

B. Pappus feathery, *receptacle* naked.

* *Involucrum* simple, leafy, equal.

2. *TRAGOPO'GON*, [Page 1019.] *Involucrum* simple, of from eight to twelve leafy scales, united at the base. *Receptacle* naked. *Fruit* longitudinally striated and beaked. *Pappus* feathery.

* *Involucrum* imbricated.

3. *THRIN'CIA*, [Page 1021.] *Involucrum* imbricated. *Receptacle* naked. *Fruit* gradually tapering into a beak. *Pappus* of the marginal florets short, scaly, cupped, of those of the disk short, feathery, unequal.

4. *PI'CRIS*, [Page 1021.] *Involucrum* imbricated, of numerous equal erect scales, and several small linear scattered ones. *Receptacle* naked. *Fruit* gradually tapering into a point, transversely striated. *Pappus* deciduous, united into a ring at the base, the outer of a few hairs, the inner feathery.

5. *APAR'GIA*, [Page 1022.] *Involucrum* imbricated, of numerous hairy black scales. *Receptacle* naked. *Fruit* pointed, smooth. *Pappus* feathery.

6. *LEONTO'DON*, [Page 1024.] *Involucrum* imbricated, the outer scales frequently lax and flaccid. *Receptacle* naked. *Fruit* with a very long slender beak. *Pappus* feathery, persistent, hairy.

7. *HELMIN'THIA*, [Page 1025.] *Involucrum* double, the inner of eight equal scales, the outer of four or five lax leafy ones. *Receptacle* naked. *Fruit* transversely striated, its beak long, capillary. *Pappus* feathery, persistent.

C. Pappus simple, *receptacle* naked.

* *Pappus* hair-like.

8. *IACTU'CA*, [Page 1026.] *Involucrum* cylindrical imbricated, membranous on the margin. *Receptacle* naked. *Flowers* few. *Fruit* compressed, terminating in a long slender beak. *Pappus* hairy, soft, fugacious, stalked.

9. *SON'CHUS*, [Page 1029.] *Involucrum* oblong, imbricated, with two rows of unequal scales. *Receptacle* naked.

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Fruit compressed, the apex truncated. *Pappus* short, hairy, sessile.

10. BARKHAU'SIA, [Page 1032.] *Involucrum* oval, with deciduous awl-shaped scales, ribbed and furrowed when in fruit, the outer ones lax. *Receptacle* naked. *Fruit* striated, tapering into a long slender beak. *Pappus* hairy, stalked.

11. CREPIS, [Page 1033.] *Involucrum* sub-imbricated, lax when in fruit, usually ribbed. *Receptacle* naked. *Fruit* roundish, or sub-compressed, numerous striated. *Pappus* hairy, soft, deciduous, sessile.

12. HIERACIUM, [Page 1036.] *Involucrum* imbricated. *Receptacle* dotted, naked, or with a few short hairs. *Fruit* roundish, furrowed, striated, or sub-prismatical, with an entire or crenated marginal ring at the top. *Pappus* hairy, sessile, fragile, persistent, mostly of a dirty brownish white.

- CICORIUM, [Page 1043.] *Involucrum* of eight scales, united at the base, and surrounded by five smaller outer ones. *Receptacle* naked, or slightly hairy. *Fruit* striated. *Pappus* scaly, sessile, shorter than the fruit.

** *Pappus* none.

14. LAPSA'NA, [Page 1044.] *Involucrum* of numerous linear lanceolate scales, and small scattered ones at the base, erect, and unchanged in fruit. *Receptacle* naked. *Fruit* compressed, striated, deciduous. *Pappus* none.

15. ARNOSERIS, [Page 1045.] *Involucrum* of numerous linear lanceolate scales, and small scattered ones at the base, converging into a globose head when in fruit. *Receptacle* naked. *Fruit* obovate, pentagonal, furrowed, deciduous. *Pappus* none.

2. *Florets all with tubular corollas, and generally spreading, so as to form a hemispherical head. Style jointed towards the apex.*

A. *Receptacle excavated, like a honey-comb.*

16. ONOPORDUM, [Page 1046.] *Involucrum* tumid, imbricated, the scales spreading, and spinous. *Receptacle* excavated, like a honey-comb. *Fruit* compressed, four angled, and transversely furrowed. *Pappus* hairy, rough, united into a ring at the base, deciduous.

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B. *Receptacle paleaceous, pappus feathery.*

17. CARLINA, [Page 1047.] *Involucrum* imbricated, tumid, the outer scales with numerous spines, spreading at the points, the inner mostly simple and acute, the innermost much longer, membranous, ligulate, coloured, spreading like rays. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* feathery, united at the base into a ring.

C. *Receptacle between paleaceous and bristly.*

- * *Pappus hairy or feathery, united at the base into a ring, feathery.*

18. CAR'DUUS, [Page 1048.] *Involucrum* imbricated, tumid, the scales simple, spinous at the point. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* hairy, united into a ring at the base, deciduous.
20. CIR'SIUM, [Page 1050.] *Involucrum* ovate, imbricated, the scales simple, spinous at the point. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* feathery, united at the base into a ring, deciduous.

** *Pappus of short unequal hairs.*

19. LA'FFA, [Page 1056.] *Involucrum* globose, imbricated, the scales spinous, the apex recurved into a hook. *Receptacle* paleaceous. *Pappus* short, of rigid unequal hairs.
21. SERRA'TULA, [Page 1057.] *Involucrum* oblong, imbricated, the scales unarmed, acute. *Receptacle* paleaceous, the scales mostly cut into numerous linear bristles. *Pappus* persistent, of unequal rigid hairs.

*** *Pappus of mixed, toothed, and feathery hairs.*

22. SAUSSUREA, [Page 1058.] *Involucrum* oblong, imbricated, the scales unarmed. *Receptacle* paleaceous, or bristly. *Pappus* in two rows, the outer of short minutely notched hairs, the inner feathery and longer.
3. *Florets all with tubular corollas, erect and crowded, forming a level top, without a ray, or rarely with one.*

A. *Receptacle naked.*

* *Pappus hairy.*

23. EUPA'TORIUM, [Page 1059.] *Involucrum* oblong, cylin-

SYNOPSIS OF THE GENERA.

- drical, imbricated, with ovate oblong scales. *Florets* few. *Style* much elongated. *Receptacle* naked, flat. *Pappus* hairy.
24. PETAS'ITES, [Page 1060.] *Involucrum* of two rows of lanceolate scales. *Florets* all perfect, or the central ones perfect, and those of the ray with pistils only. *Receptacle* naked, flat. *Pappus* hairy.—*Scape* many flowered, appearing before the leaves.
25. CHERYSO'COMA, [Page 1061.] *Involucrum* imbricated, hemispherical, or ovate, the scales linear. *Florets* all perfect, and tubular. *Receptacle* excavated, naked. *Pappus* hairy, rough, or ciliated.
26. FILA'GO, [Page 1061.] *Involucrum* imbricated, scales equal, acuminate, the margin membranous, coloured, longer than the florets. *Florets* slender, tubular, those of the disk perfect on the circumference, with pistils only. *Receptacle* conical, toothed, tuberculated, or paleaceous. *Pappus* hairy, often wanting.
27. GNAPHAL'IUM, [Page 1063.] *Involucrum* imbricated, scale unequal, obtuse, membranous, coloured, as long as the florets. *Florets* slender, tubular, those of the disk perfect on the circumference, with pistils only. *Receptacle* flat, naked. *Pappus* hairy, often thickened upwards.
- ** *Pappus* wanting, or very short.
28. ARTEMISI'A, [Page 1067.] *Involucrum* imbricated, ovate or globose. *Florets* few, all perfect, tubular, or those of the disk perfect, and of the circumference with pistils only. *Receptacle* naked, or hairy. *Pappus* wanting.
29. TANACE'TUM, [Page 1070.] *Involucrum* hemispherical, imbricated. *Florets* all tubular, of the disk five lobed, perfect, of the ray three lobed, and with pistils only. *Receptacle* naked. *Fruit* crowned, with a membranous margin in the place of *pappus*.

B. *Receptacle* paleaceous,

30. BI'DEUS, [Page 1071.] *Involucrum* of many scales, the outer ones mostly leafy, and spreading. *Florets* all tubular, and perfect, or if ligulate on the circumference imperfect. *Receptacle* plane, paleaceous. *Pappus* of from two to five persistent lobes.

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31. *DIO'TIS*, [Page 1072.] *Involucrum* hemispherical, imbricated. *Florets* all tubular, perfect, five toothed, contracted in the middle, auriculated or saccated on one side at the base. *Receptacle* convex, paliaceous, its scales fringed. *Fruit* crowned by the lower persistent half of the corolla, in the place of *pappus*.

ORDER II. POLYGAMIA SUPERFLUA.

(*Florets of the centre with tubular corollas perfect, (having stamens and pistils), those of the circumference imperfect, (having pistils only), the corollas ligulate, and forming a ray.*)

1. *Pappus* hairy, *receptacle* naked.

A. *Involucrum* imbricated, of numerous scales.

32. *I'NULA*, [Page 1073.] *Involucrum* imbricated. *Florets* of the ray ligulate, imperfect. *Anthers* bristle pointed, at the base. *Receptacle* naked. *Pappus* hairy, in a single row.
33. *PULICA'RIA*, [Page 1075.] *Involucrum* imbricated. *Florets* of the ray ligulate, imperfect. *Anthers* bristle pointed at the base. *Receptacle* naked. *Pappus* double, the outer short, membranous, cup-shaped, toothed or crenated on the margin, the inner of elongated hairs.
34. *A'STER*, [Page 1076.] *Involucrum* imbricated, the scales linear, acute. *Florets* of the ray ligulate, imperfect, usually purple, those of the disk tubular, perfect, yellow. *Receptacle* naked. *Fruit* compressed. *Pappus* hairy, in many rows.
35. *ERI'GERON*, [Page 1077.] *Involucrum* imbricated, with linear scales, very numerous. *Florets* of the ray imperfect, with very narrow linear ligulate corollas. *Receptacle* naked. *Pappus* hairy, rough.
36. *SOLIDA'GO*, [Page 1079.] *Involucrum* imbricated. *Floret* of the ray ligulate, imperfect, yellow, about five in number. *Receptacle* naked. *Fruit* roundish. *Pappus* hairy, in a single row.
- B. *Involucrum* cylindrical.
37. *CINER'ARIA*, [Page 1080.] *Involucrum* cylindrical, of numerous erect equal scales. *Florets* yellow, those of

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the ray ligulate. *Receptacle* naked. *Fruit* sulcated. *Pappus* hairy.

38. SENE'CIO, [Page 1081.] *Involucrum* cylindrical, or conical, of numerous linear equal scales, and several smaller ones scattered at the base, the tips mostly brown or black. *Florets* of the ray ligulate, sometimes wanting. *Receptacle* naked. *Fruit* sulcated. *Pappus* hairy.
39. TUSSILA'GO, [Page 1086.] *Involucrum* formed of a single row of linear scales, membranous on the margin. *Florets* yellow, those of the ray long, narrow, numerous, imperfect, of the disk few perfect. *Receptacle* naked, pappus hairy.—*Scape* single flowered, appearing before the leaves.

C. *Involucrum* hemispherical.

40. DORO'NICUM, [Page 1087.] *Involucrum* hemispherical, or flat, its scales equal, in a double row. *Florets* yellow, those of the ray ligulate, five toothed. *Receptacle* naked. *Pappus* hairy, wanting on the marginal florets. *Fruit* sulcated.

2. *Pappus* wanting, *receptacle* naked.

41. BE'LLIS, [Page 1088.] *Involucrum* hemispherical, simple, of numerous obtuse lanceolate scales. *Florets* of the ray ligulate, imperfect. *Receptacle* conical, naked. *Pappus* none.
42. CHRYSAN'THEMUM, [Page 1090.] *Involucrum* hemispherical, or flat, the scales imbricated, membranous on the margin. *Florets* of the circumference ligulate, with a compressed tube. *Receptacle* naked. *Fruit* without pappus, or crowned with a membranous margin.
43. MATRICA'RIA, [Page 1093.] *Involucrum* hemispherical, or flat, the scales obtuse, without a membranous margin. *Florets* of the circumference ligulate, with a compressed tube. *Receptacle* naked, conical. *Pappus* wanting.

3. *Pappus* wanting. *Receptacle* paleaceous.

44. ANTHE'MIS, [Page 1093.] *Involucrum* hemispherical, or flat, its scales imbricated, with a membranous margin. *Florets* of the circumference ligulate, imperfect. *Receptacle* convex, paleaceous. *Fruit* crowned with a more or less prominent margin.

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45. ACHIL'LEA, [Page 1097.] *Involucrum* ovate, imbricated. *Florets* of the circumference from five to ten, its limb short, roundish. *Receptacle* flat, paleaceous. *Fruit* compressed, the apex simple, or crowned by a prominent margin.
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ORDER III. POLYGAMIA FRUSTRANEA.

(*Florets of the disk perfect and fertile, those of the circumference neuter*).

46. CENTAU'REA, [Page 1099.] *Involucrum* imbricated, its scales leafy, membranous, or spiny. *Florets* of the circumference longer than those of the disk. *Receptacle* paleaceous, its scales much cut or jagged. *Pappus* hairy, or wanting. *Fruit* compressed.
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CLASS 20. GYNANDRIA.

(*Stamens situated upon the style or column, above the germen*).

ORDER I. MONANDRIA.—1 *Stamen*.

(*All the Natural Order Orchideæ, Juss.*

TRIBE 1. *Pollen masses stalked, of an indefinite number of cohering grains, enclosed in a pouch.* (OPHRYDÆ, Lindley.)

1. OR'CHIS, [Page 1103.] *Sepals* and *petals* personate, ringent, *lip* lobed and spurred at the base. *Pollen masses* with two glands, enclosed in a common pouch.
2. GYMNADE'NIA, [Page 1111.] *Pollen masses* naked, approximated, the rest as *Orchis*.
3. HABENA'RIA, [Page 1112.] *Sepals* and *petals* personate, ringent, arched or helmet-shaped above, *lip* spurred at the base. *Glands* of the stalks of the *pollen masses* naked, distant.
4. ACE'RAS, [Page 1114.] *Sepals* and *petals* herbaceous, personate, ringent, helmet-shaped above, *lip* three partite, without a spur at the base. *Glands* of the stalks of the *pollen masses* enclosed in a common pouch.
5. HERMI'NIUM, [Page 1115.] *Sepals* and *petals* herbaceous, spreading, *lip* short, lobed, not spurred, but saccate at

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the base. *Glands* of the stalks of the *pollen masses* naked, distinct.

6. O'PHRYA, [Page 1116.] *Sepals* spreading, coloured, or herbaceous, *petals* much smaller than the sepals, and mostly coloured, *lip* without a spur, convex, more or less lobed. *Glands* of the stalks of the *pollen masses* in separate pouches, each mass deeply divided into numerous angular lobes.

TRIBE 2. *Pollen masses*, not stalked, simple, consisting of granules, in a slight state of cohesion. *Anthers* parallel with the stigma. (NEOTTIEÆ, Lindley).

7. GOODYE'RA, [Page 1119.] *Sepals* ovate, spreading. *Petals* erect, *lip* entire, remarkably concave beneath, enclosed by the lateral sepals. *Column* taper, distinct, with two teeth at the apex. *Stigma* in front oblique. *Anthers* two celled. *Pollen masses* sessile.

8. NEOTT'IA, [Page 1120.] *Sepals* and *petals* brown, sub-campanulate, *lip* not spurred, dependent, two lobed, concave at the base. *Column* taper, erect, four times as long as the stigma. *Stigma* two lipped. *Anther* naked, terminal, free, attached to the back of the stigma.

9. SPIRAN'THES, [Page 1121.] *Sepals* and *petals* coloured, converging, parallel with the lip. *Lip* included within the lateral segments, entire, unguiculate, with two fleshy projections at the base. *Column* taper, club-shaped, free, with two teeth at the apex. *Stigma* prominent, rostrate.

10. LISTE'RA, [Page 1122.] *Sepals* and *petals* herbaceous, connivent, *lip* two lobed, dependent, not spurred. *Column* taper, erect, much shorter than the stigma. *Stigma* plane, ovate. *Anther* covered by a hood, proceeding from the back of the column. *Pollen* farinaceous.

TRIBE 3. *Pollen masses*, not stalked, simple, consisting of granules, in a slight state of cohesion. *Anthers* terminal, like a lid, persistent. (ARTHUSEÆ, Lindley).

11. EPIPAC'TIS, [Page 1123.] *Sepals* and *petals* spreading or converging, more or less coloured, *lip* embracing the

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column, inflated at the base, entire, or three lobed, the middle lobe large, and jointed to the others. *Column* plano-convex, with two teeth at the apex. *Pollen masses* acuminate. *Anther* two celled.

12. CORALLOE'HIZA, [Page 1127.] *Sepals* and *petals* more or less coloured, arching or spreading, *lip* more or less lobed, spurred at the base. *Spur* often adhering to the ovary. *Column* free, plano-convex entire. *Anthers* terminal, free, deciduous, round, two celled, with two anterior valves. *Pollen masses* four, spherical, solid.

TRIBE 4. *Pollen cohering in grains or masses, which are definite in number, and waxy.* (MALAXIDÆ, Lindley.)

13. MALAX'IS, [Page 1128.] *Sepals* herbaceous, ovate, spreading. *Petals* herbaceous, reflexed. *Lip* uppermost, much smaller than the sepals, not spurred, embracing the column at the base. *Column* very short, excavated in front. *Pollen masses* four, oblong. *Anthers* terminal, deciduous.

14. LIPA'RIS, [Page 1129.] *Sepals* more or less herbaceous, spreading. *Petals* linear, spreading, *lip* undermost, much larger than the sepals, undivided, reflexed. *Column* nearly as long as the sepals. *Anthers* terminal, deciduous. *Pollen masses* four, oblong.

TRIBE 5. *Lateral anthers fertile, the intermediate one sterile, and petaloid.* (CYPRIPEDIDÆ, Lindley.)

ORDER II. DIANDRIA.—2 *Stamens*.

15. CYPRIPE'DIUM, [Page 1130.] *Sepals* loosely spreading. *Lip* very large, obtuse, inflated, slipper-shaped. *Column* terminated at the back by a petaloid lobe (the sterile anther), and separating the anthers, the two anterior sepals often united.

ORDER III. HEXANDRIA.—6 *Stamens*.

16. ARISTOLO'CHIA, [Page 1131.] *Perianth* single, superior, tubular, mostly swollen at the base, the mouth dilated, and elongated on one side into a ligula. *Anthers* six, sub-sessile, inserted into the style. *Stigma* six-cleft. *Capsule* inferior, six celled, six angled.

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CLASS 21. MONOECIA.

(*Stamens and Pistils in separate flowers on the same plant.*)

ORDER I. MONANDRIA.—1 *Stamen.*

1. EUPHORBIA, [Page 1132.] *Involucre* of one piece, five cleft, surrounded with five alternating glands. *Head* of numerous *barren flowers*, (10 to 20 or more each a single, stamens without calyx or corolla), surrounding the *fertile one* (a single pistil, without calyx or corolla, elevated upon a pedicel). *Style* three cleft. *Fruit* hanging out of the involucre, three celled, each cell bursting elastically at the back, containing one, rarely two, suspended seeds.
2. CALLITRICHÉ, [Page 1144.] *Flowers* generally monoecious. *Perianth* of two petaloid pieces, *barren flower* a single stamen, with a filiform filament. *Anthers* one celled, two valved, *fertile flower* with its *ovary* four angled, four celled, two styles. *Capsule* four celled, four seeded, indehiscent. *Seed* peltate. *Radicle* very long, curved, superior. *Cotyledons* very short.—*Small aquatic plants.*
3. ZANNICHELLIA, [Page 1146.] *Flowers* solitary, *barren flowers* a single naked stamen, inserted at the outside of the base of the perianth of the *fertile flower*, which is campanulate, surrounding two to six ovaries. *Stigma* peltate. *Fruit* dry, single seeded, compressed, gibbous, crenated externally.—*Slender spreading water plants.*
4. ZOSTERA, [Page 1147.] *Stamens* and pistils inserted in two rows upon one side of a spadix. *Spatha* foliaceous. *Stamens* sessile, anthers alternating with the ovaries. *Ovary* ovate. *Style* bifid. *Fruit* a one seeded nut.—*Slender spreading water plants, with grass-like leaves.*

(For *Chara*, see CLASS CRYPTOAMIA).

ORDER II. DIANDRIA.—2 *Stamens.*

(See *Callitriche* in ORDER I. *Carex* in ORDER 3.)

ORDER III. TRIANDRIA.—3 *Stamens.*

* *Flowers in spherical heads.*

5. SPARGANIUM, [Page 1148.] *Flowers* in naked globose

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heads, *barren flowers* with a single *perianth*, of three pieces, six *stamens*, the *anthers* wedge-shaped, *fertile flowers* with a single *perianth*, of three pieces, surrounding a solitary superior ovary. *Fruit* sessile, single seeded.

** *Flowers in cylindrical spikes.*

6. TY'PHA, [Page 1150.] *Flowers* in dense cylindrical naked spikes or catkins, *barren flowers* without *perianth*. *Stamens* three, united at the base into a single filament, *fertile flowers* without *perianth*, *fruit* single seeded, pedicellated, the pedicel surrounded at the base with long pappus-like hairs.
7. CA'REX, [Page 1161.] *Flowers* in imbricated cylindrical spikes, *barren flowers* mostly collected in terminal spikelets, *perianth* wanting. *Stamens* on slender filaments, mostly three, *fertile flowers* in imbricated spikelets, *perianth* (formed of united scales) urceolate, and forming a persistent covering to the triquetrous nut. *Styles* two or three.
8. KOBIE'SIA, [Page 1189.] *Spikelets* two flowered, upper ones barren, the lower fertile. *Scales* imbricated in many rows, single flowered, *barren flower* of three *stamens*, without *perianth*, *fertile flowers* with one *style* and three *stigmas*, the ovary embraced with two scales. *Fruit* a somewhat three cornered nut, mucronate, and enclosed in a membranous pouch.

ORDER IV. TETANDRIA.—4 *Stamens*.

9. LITTORE'LLA, [Page 1189.] *Barren flowers* pedicellated. *Calyx* and *corolla* four-partite. *Stamens* very long. *Fertile flower* sessile. *Calyx* three-partite. *Corolla* urceolate, contracted at the mouth, and obsoletely toothed. *Style* long. *Capsule* single seeded.—*Low grass-like plants*.
10. BUX'US, [Page 1190.] *Flowers* clustered, axillary. *Barren flowers* with a three-partite *calyx*, and a *corolla* of two pieces. *Rudiments* a germen two lobed scales. *Stamens* four, inserted into the rudiments of the germen. *Fertile flower* with a four partite *calyx*, and a *corolla* of three pieces. *Styles* three. *Stigmas* three, obtuse. *Capsules*

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with three horns, three celled, each *cell* two seeded.—*Evergreen shrub.*

11. URTICA, [Page 1192.] *Barren flowers* in loose racemes, *perianth* single, four-partite. *Stamens* four, curved inwards before the anthers are matured. *Fertile flowers* in capitate racemes. *Perianth* single, of two pieces. *Stigma* single. *Fruit* single seeded, surrounded with the perianth.

12. AL'NUS, [Page 1194.] *Flowers* in imbricated *catkins*, *barren flowers* elongated, cylindrical, *catkins* with cordate scales, pedicellated, and with three small scales beneath them, bearing stamens from the base. *Perianth* single, four-partite. *Fertile flowers* roundish ovate *catkins*, the scales sub-trifid, two flowered, coriaceous, persistent, *perianth* wanting. *Stigma* two. *Fruit* compressed, ovate, two celled, each cell two seeded.—*Low deciduous trees, growing in moist places.*

(See *Eriocaulon* in ORDER 6. *Myrica* in CLASS 22.)

ORDER V. PENTANDRIA.—5 *Stamens.*

13. XANTHIUM, [Page 1196.] *Barren flowers* several globose terminal heads, each head surrounded by an *involucre*, of a single row of scales, the *receptacle* paleaceous, *florets* numerous, each a single clavate *perianth*, with five short lobes, containing numerous stamens, and two abortive stigmas. *Fertile flowers* two, enclosed in a single prickly *involucre*, with two beaks, *perianth* wanting. *Stigmas* two, protruding through small apertures within the beak. *Fruit* compressed, each occupying a cell within the hardened *involucre*.—*Annual herbaceous plants, nearly allied to Compositæ.*

14. AMA'RANTHUS, [Page 1197.] *Barren flowers* with a single *perianth*, deeply three or five-cleft. *Stamens* three to five. *Fertile flowers* with the *perianth* deeply three or five-cleft. *Styles* three. *Fruit* a one celled single seeded capsule, crowned by the persistent style, and opening all round by a transverse incision.—*Low branched succulent herbaceous plants.*

15. BRYO'NIA, [Page 1198.] *Barren flowers* with a five toothed

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calyx, a five cleft *corolla*, and *stamens* in three¹ parcels. *Fertile flowers*. *Calyx* five toothed. *Corolla* five cleft. *Style* three cleft. *Fruit* an inferior *berry*, globose. *Seeds* small, ovate, compressed, more or less bordered.—*Long climbing herbaceous plants, with simple or cleft tendrils*.

(See *Fagus* and *Quercus* in ORDER POLYANDRIA. *Atroplex* in CLASS POLYGAMIA.

ORDER VI. HEXANDRIA.—6 *Stamens*.

16. ERIOCAU'LON, [Page 1200.] *Flowers* collected into a compact scaly *head*, each scale single flowered, except the outer ones, which are barren, and forming an involucre. *Barren flowers* in the centre. *Perianth* single, unequally four to six cleft. *Stamens* four to six. *Fertile flowers* in the ray. *Perianth* single, deeply four partite. *Style* one. *Stigmas* two or three. *Capsules* two or three lobed, two or three called, each cell single seeded.

(See *Quercus* in ORDER POLYANDRIA).

ORDER VII. POLYANDRIA.—Many *Stamens*.

* *Flowers with a single perianth, or wanting, not in catkins*.

17. CERATOPHYLLUM, [Page 1201.] *Barren flowers* with an inferior many partite *perianth*. *Stamens* sixteen to twenty. *Fertile flowers* with a many partite *perianth*. *Ovarium* superior. *Style* filiform, curved, simple. *Fruit* a one celled *nut*, with a pendulous seed.—*Floating herbs, with leaves numerous divided into hair-like segments*.
18. A'RUM, [Page 1202.] *Spatha* of one leaf, convolute at the base, and enclosing a *spadix*. *Spadix* with the ovaries inserted at the base, about the middle numerous rows of sessile *anthers*, and above it is naked. *Fruit* a *berry*, one celled, many seeded.
19. POTE'RIUM, [Page 1204.] *Flowers* collected into dense heads, with three or four scaly bracteas at the base of each. *Barren flowers* with a four cleft *perianth*. *Stamens* thirty to forty, with long slender *filaments*. *Fertile flowers* with a tubular *perianth*, contracted at the mouth with four deciduous teeth. *Styles* two, filiform. *Stigmas* tufted. *Fruit* two, one seeded. *Nuts* invested with the

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hardened four angled tube of the perianth.—*Herbaceous plants, with unequal pinnate leaves.*

**** Flowers with a single perianth, the barren ones in catkins.**

20. **QUER'CUS**, [Page 1205.] *Barren flowers* in lax pendulous catkins. *Perianth* single, lacerated. *Stamens* five to ten. *Fertile flowers* with an involucre of numerous small scales, united into a cup. *Perianth* single, closely investing and adhering to the ovary, six toothed. *Ovary* three celled, two of the cells abortive. *Stigmas* three. *Fruit* (acorn) one celled, single seeded, surrounded at the base by the cup-shaped involucre.—*Large forest trees, with hard durable wood.*
21. **CASTA'NEA**, [Page 1210.] *Barren flowers* in very long irregular clustered catkins. *Perianth* single, six cleft. *Stamens* five to twenty. *Fertile flowers* three, within a thick four lobed involucre, very spiny on the outside. *Perianth* single, urceolate, five or six lobed, and with the rudiments of twelve stamens, smooth on the outside, lined with a stout shining coat of hairs within. *Ovarium* six celled, incorporated with the perianth, six celled, each cell two seeded, five of which are mostly abortive. *Styles* six. *Fruit* a sub-rotundate one to three seeded nut, enveloped in the enlarged spiny involucre.—*Large forest trees, with elliptic-lanceolate leaves.*
22. **FA'GUS**, [Page 1212.] *Barren flowers* in a globose catkin, pendulous. *Perianth* single, bell-shaped, six cleft. *Stamens* five to twelve. *Fertile flowers* two in a four lobed prickly involucre. *Perianth* single, urceolate, four or five lobed, adhering to the ovary. *Styles* three. *Ovarium* three angled, three celled. *Fruit* a three angled nut, three celled, two of which are abortive, one or two seeded, invested with the enlarged involucre.—*Large forest trees, with ovate lanceolate leaves.*
23. **CORY'LUS**, [Page 1214.] *Barren flowers* in a cylindrical catkin, its scales three lobed, the middle one largest, and covering the lateral ones. *Stamens* eight. *Anthers* one celled. *Fertile flowers* numerous (*perianth* obsolete), enclosed in a scaly bud. *Stigmas* two. *Fruit* a one seeded nut, invested at the base with the united coriaceous scales of the involucre.—*Large branching shrub.*

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*** *Barren and fertile flowers in catkins.*

24. CARPINUS, [Page 1215.] *Barren flowers* in long cylindrical *catkins*, its scales roundish, ciliated at the base. *Stamens* eight to twenty. *Fertile flowers* in lax *catkins*, its scales large, leafy, three lobed, single flowered. *Perianth* scale-shaped, three lobed, two flowered, adhering to the ovary. *Ovarium* two celled, one abortive. *Styles* two. *Fruit* an ovate striated one seeded *nut*.
25. BETULA, [Page 1216.] *Barren flowers* in cylindrical *catkins*, its scales three flowered, the middle one bearing stamens. *Fertile flowers* in cylindrical *catkins*, its scales three lobed, three flowered, membranous. *Styles* two, ovary, compressed, two celled, one of the cells abortive. *Fruit* a compressed one celled *nut*, with winged margins.

**** *Flowers with a double perianth.*

26. MYROPHYLLUM, [Page 1220.] *Barren flowers*. *Calyx* inferior, four partite. *Petals* four, alternating with the lobes of the calyx. *Stamens* eight. *Fertile flowers*. *Calyx* four lobed. *Petals* four, or wanting. *Stigmas* four, sessile. *Fruit* four *nuts*, compressed, sub-globose, single seeded.—*Floating herbs, rising above the water at the time of flowering.*
27. SAGITTARIA, [Page 1221.] *Barren flowers*. *Calyx* of three pieces. *Petals* three. *Stamens* numerous. *Fertile flowers*. *Calyx* of three pieces. *Petals* three. *Ovaries* numerous, on a globose receptacle. *Capsules* small, compressed, margined, single seeded.

ORDER VIII. MONODELPHIA.—*Stamens united into one set.*

28. PRINUS, [Page 1222.] *Barren flowers* crowded into terminal racemose *catkins*, the scales peltate, bearing two, single celled *anthers*. *Fertile flowers* in compact ovate *catkins* or *cones*, its scales acuminate, closely imbricated, two flowered. *Ovaries* two. *Stigmas* glandular. *Nuts* in pairs, single seeded, terminated by a long winged membranous appendage.
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CLASS 22. DIOECIA.

(*Stamens and Pistils in separate flowers and on different plants*).

(MONANDRIA, 1 *Stamen*. For some *Salices* see ORDER 2.)

ORDER I. DIANDRIA.—*Stamens* 1 to 5, mostly 2).

1. SA'LIX, [Page 1227.] *Flowers* in catkins, the scales imbricated, and a gland surrounds the stamens and ovary. *Barren flowers* with from two to five stamens, sometimes the anthers are united. *Fertile flowers* with two stigmas. *Fruit* a one celled follicle, with a gland at the base. *Seeds* covered with down. *Radicle* inferior.

ORDER II. TRIANDRIA.—3 *Stamens*.

2. EMPETRUM, [Page 1276.] *Flowers* with the perianth of numerous imbricated scales, the inner ones often regular, spreading, and petaloid. *Barren flowers* with three stamens, the filaments long. *Fertile flowers* with a peltate stigma, in numerous rays. *Fruit* a superior globose berry, with six to nine seeds.
3. RUSCUS, [Page 1277.] *Perianth* single, of six pieces on the back of the leaves, generally expanding. *Barren flower* with the filaments combined at the base. *Anthers* three to six. *Fertile flower* with a single style and stigma. *Nectary* tubular. *Fruit* a globose three celled berry, each cell two seeded.

(See *Valeriana dioica* in CLASS 3. Some *Salices* in ORDER 1.)

ORDER III. TETRANDRIA.—4 *Stamens*.

4. VIS'UM, [Page 1278.] *Calyx* obsolete. *Barren flowers* with four ovate fleshy petals, united at the base, each bearing about its middle a sessile anther. *Fertile flower* with four erect small ovate petals. *Stigma* sessile. *Fruit* an inferior one seeded berry.
5. HIPPOPHÆ, [Page 1280.] *Barren flowers* collected into a small kind of catkin, each scale bearing a flower. *Perianth* tubular, bifid at the apex, closed. *Anthers* linear, sessile, two celled. *Fertile flowers* solitary, perianth

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single, tubular, cloven at the summit. *Style* short. *Stigma* subulate. *Fruit* a one seeded *nut*, surrounded by the coloured succulent calyx.

6. MY'RIOA, [Page 1281.] *Calkins* with concave scales. *Perianth* wanting. *Barren flowers* with from four to six *stamens*, the anthers four valved. *Fertile flower* with two *styles* and single ovary. *Fruit* a one celled single seeded *drupe*, the seed without albumen.
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ORDER IV. PENTANDRIA.—5 *Stamens*.

7. HU'MULUS, [Page 1282.] *Barren flowers* in loose racemes, perianth single, five partite. *Stamens* five, the anthers opening with two pores at the extremity. *Fertile flowers* oblong *calkins* or *cones*, its scales membranous, large, concave, persistent, having a single flower at the axis of each. *Styles* two. *Fruit* single seeded. *Embryo* spiral.

(See *Ribes* in CLASS 5. *Bryonia* in CLASS 21. *Salix* in ORDER 1).

ORDER V. HEXANDRIA.—6 *Stamens*.

8. TA'MUS, [Page 1284.] *Perianth* six partite, single. *Barren flowers*, perianth spreading. *Stamens* six. *Fertile flowers*, perianth superior, contracted at the neck. *Style* one. *Stigmas* three. *Berry* ovate, three celled, each *cell* two seeded.

(See *Rumex* in CLASS 6.)

ORDER VI. OCTANDRIA.—8 *Stamens*.

9. POPU'LUS, [Page 1286.] *Flowers* in cylindrical *calkins*, the scales jagged at the end. *Barren flowers* eight to twenty. *Stamens* arising from an obliquely truncated *cup* at the base of the scales. *Fertile flowers*, perianth turbinate. *Stigmas* four to eight. *Capsules* superior, imperfectly two celled by the rolling in of the edges of the valves. *Seeds* numerous, comose. *Radicle* superior.
10. RHODIO'LA, [Page 1290.] *Perianth* double. *Calyx* four partite, small. *Petals* four, oblong, narrow. *Glands* four, emarginate. *Barren flowers* with eight spreading *sta-*

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mens. Fertile flowers with four *carpels*, single celled, many seeded.—*A low fleshy herbaceous plant, with pale yellow cymose flowers.*

ORDER VII. ENNEANDRIA.—9 *Stamens.*

11. MERCURIA'LIS, [Page 1291.] *Perianth* single, three partite. *Barren flowers* with nine to twelve *stamens*, the *anthers* of two globose lobes. *Fertile flowers* with two *styles*, and two barren styles from a furrow on each side of the ovary. *Capsules* two celled, each cell single seeded:
12. HYDRO'CHARIS, [Page 1292] *Barren flowers. Spatha* two partite, three flowered. *Perianth* double. *Calyx* in three deep segments. *Corolla* three spreading petals. *Stamens* nine, in three rows on the abortive ovary. *Fertile flowers. Spatha* sessile, single flowered. *Perianth* like that of the barren flowers, and with six filiform abortive stamens. *Styles* six. *Stigmas* wedge-shaped, bifid. *Capsule* coriaceous, roundish, six celled, many seeded.

(ORDER DECAENDRIA. See *Silene* and *Lychnis* in CLASS 10.—
ORDER ICOSANDRIA. See *Rubus* and *Fragaria* in CLASS 12.—ORDER POLYANDRIA. See *Stratiotes* in CLASS 21.—
See *Populus* in ORDER 6).

ORDER VIII. MONADELPHIA.—*Stamens combined.*

13. JUNIF'ERUS, [Page 1293.] *Barren flowers*, scales of the *catkin* ovate, sub-peltate. *Stamens* four to eight, single celled. *Fertile flowers, catkins* globose, its scales few, at length united, becoming fleshy, and surrounding the berry. *Stigma* gaping. *Berry* compose of three bony single seeded *nuts*.
 14. TA'XUS, [Page 1294.] *Catkins* scaly at the base. *Barren flowers* with from 8 to 10 *stamens*, the *filaments* united. *Anthers* peltate, six to eight celled, the cells opening beneath. *Fertile flowers* with a concave sessile *stigma*. *Fruit* a succulent *drupe*, gaping at the apex. *Nut* single seeded.
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CLASS 23. POLYGAMIA.

(*Stamens and Pistils separate, or united, on the same or on different plants, and having two different kinds of perianth.*)

ORDER 1. MONOEOLA.—*Flowers different, on the same plant.*

1. ATRI'PLEX, [Page 1297.] *Barren and united flowers. Perianth* five partite. *Stamens* five, pistils imperfect, rarely perfect. *Fertile flowers*, the *perianth* single, of two valves, compressed, becoming larger after flowering, and covering the seed. *Style* bifid. *Fruit* an *article*, with a single vertical *seed*, albuminous, its *testa* crustaceous, attached by a lateral hilum near to the base, or to the middle of the side, by means of an elongated funiculus *pericarp*, membranous, free.
2. HALI'MUS, [Page 1303.] *Barren and united flowers. Perianth* five partite. *Stamens* five, pistils imperfect, rarely perfect. *Fertile flowers. Perianth* of two parts, united to the extremity, three toothed, wedge-shaped below, becoming larger after flowering, and inclosing the seed. *Stigmas* two. *Fruit* an *article*, with a single vertical seed, albuminous, its *testa* membranous, pendulous, from an elongated funiculus, *radical* terminal. *Pericarp* very thin, ultimately adhering to the tube of the perianth.





1077

Erodium cicutarium.



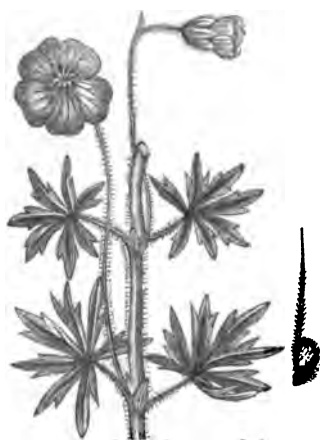
1078

Erodium moschatum.



1079

Erodium maritimum.



1080

Geranium sanguineum.



1081

Geranium phaeum.



1082

Geranium nodosum.

CLASS XVI.

MONADEL'PHIA.

(*Filaments combined in one set.*)

ORDER I.

PENTAND'RIA. (*Stamens five perfect.*)

GENUS I. ERO'DIUM.—L'HERITIER. *Stork's-bill.*

Nat. Ord. GERANIACE'Æ. DE CAND.

GEN. CHAR. *Calyx* of five pieces. *Petals* five. *Stamens* ten, five alternately imperfect, with a gland at the base of each. *Fruit* beaked. *Capsules* five, each with a long spirally twisted awn, bearded on the inner side.—Name from *ερωδιος*, a *Heron*; so called from the long tapering awns resembling the beak of that bird.

1. *E. ciouta'rium*, L'Herit. (Fig. 1077.) *Hemlock-leaved Stork's-bill.* Peduncles many flowered; petals unequal, longer than the calyx; stamens smooth, the fertile ones dilated, and rounded at the base; leaves pinnate; leaflets sessile, deeply cut and toothed; stem prostrate, hairy.

English Botany, t. 1768.—English Flora, vol. iii. p. 229.—Hooker, British Flora, ed. 4. vol. i. p. 258.—Lindley, Synopsis, p. 58.

β. *maculatum*. The larger petals marked at the base with a yellowish green depression.

γ. Smith.—English Flora, vol. iii. p. 230.

Root white, long, tapering, the whole plant more or less clothed with viscid hairs, and often disagreeably scented. *Stems* mostly several, spreading, procumbent, often long, occasionally scarcely an inch high, round, or slightly angular, branched and swollen at the joints. *Leaves* pinnate, the radical ones numerous, more or less clothed with pubescence, those of the stem alternate below, opposite above, *petiole* channeled, *leaflets* ovate oblong, sessile, mostly cut to the mid-rib, and its segments toothed, obtuse, or pointed. *Stipules* pale, thin, membranous, ovate lanceolate, smooth, or ciliated at the base. *Flowers* numerous. *Inflorescence* umbellate, on an elongated hairy *peduncle* opposite to the leaf, or axillary. *Pedicles* short, slender, recurved in fruit. *Involucre* of several ovate taper pointed membranous mostly hairy pieces, sometimes torn. *Calyx* of five

oblong acute membranous margined pieces, three or five ribbed, scattered over with hairs. *Petals* longer than the calyx, obovate, three ribbed at the base, and in var. β . with a greenish depressed spot. *Stamens* ten, the five alternate filaments without anthers. *Fruit* of five oblong membranous carpels, hairy, the long hardened persistent styles united round an elongated axis, which separate from the base, and curl up by the elastic force of the styles; each carpel is single seeded, the seed pendulous, with a curved embryo.

Habitat.—Waste places; frequent.

Annual; flowering during the summer months.

2. *E. moschatum*, Sm. (Fig. 1078.) *Musky Stork's-bill*. Peduncles many flowered; petals unequal; stamens smooth, the fertile ones dilated and toothed on each side at the base; leaves pinnate; leaflets nearly sessile, unequally cut and toothed; stem depressed, hairy, viscid.

English Botany, t. 902.—English Flora, vol. iii. p. 230.—Hooker, British Flora, ed. 4. vol. i. p. 258.—Lindley, Synopsis, p. 58.

This species has the general aspect and habit of the last. The whole plant is clothed with soft viscid pubescence, especially upon the stem, petioles, and peduncles, and exhales a powerful odour resembling musk, the *leaflets* are more ovate, less deeply cut, and mostly with a short partial footstalk. *Stipules* large, ovate, waved, very thin, white and smooth. *Flowers* mostly more numerous, smaller, the *petals* pink, scarcely longer than the viscid calyx, the fertile *stamens* have the filaments dilated at the base with a tooth on each side, the barren filaments are thin pale lanceolate membranes.

Habitat.—Mountainous pastures, rare; Guernsey and Jersey, frequent; Craven, Yorkshire; Westmoreland; on Shotover Hill, near Oxford; Ampthill Warren, Bedfordshire; near Plymouth, on a bank near Countess Wear Bridge; on the Exe, Devon; near Helleston, Cornwall.—*C. A. Johns, Esq.* Simmond's Court, Carlingford Castle, and Monkstown Church, Ireland.

Annual; flowering in June and July.

3. *E. martianum*, L'Herit. (Fig. 1079.) *Sea Stork's-bill*. Peduncles single, or few flowered; petals minute; stamens smooth, the fertile ones awl-shaped; leaves simple, ovate, heart-shaped, lobed, and crenated, roughish; stem depressed, hairy.

English Botany, t. 646.—English Flora, vol. iii. p. 231.—Hooker, British Flora, ed. 4. vol. i. p. 259.—Lindley, Synopsis, p. 58.

Root slender, tapering. *Stems* mostly numerous, spreading, depressed, roundish, branched, more or less clothed with soft pale compressed hairs. *Leaves* numerous, oblong, or roundish ovate, heart-shaped at the base, more or less deeply lobed and crenated on the margin, roughish, with short hairs, and compressed pubescence, the radical leaves with long footstalks, stout, channeled, those of the stem

shorter. *Flowers* mostly several from the axis of the upper leaves, one, two, or sometimes three, elevated on a slender round hairy *peduncle*, of variable length. *Stipules* and *bractea* small, membranous, smooth. *Calyx* of oblong obtuse short pointed pieces, downy. *Petals* very small, sometimes wanting, and very fugacious. *Capsules* hairy, the awns almost smooth.

Habitat.—Sandy and gravelly places near the sea, not common; the Lizard and at Perranzabuloe, Cornwall; Steep Holmes, and near Bristol; Glenluce, Galloway, Scotland; Hill of Howth, and the South side of Killiney Hill, Ireland.

Perennial; flowering from May to September.

The *Erodiums* are herbaceous plants, bearing small inconspicuous flowers, the fruit of which is in most of the species remarkable, from the long narrow tapering hardened beak, which is formed by the elongated styles, united round a prolonged axis. The carpels are five, narrow, conical, membranous, pointed at the base, one celled, containing a single pendulous seed. The style, which becomes elongated, and forms the awn, is highly hygrometrical, and as the plant matures, this, from the unequal density of its structure, curves up with an elastic force, and becomes more or less spirally twisted in its lower part. The carpels and the inner surface of the awn is more or less thickly clothed with bristles pointed upwards. From this structure of the fruit it will be seen how admirably the progeny are provided for their future sustenance and growth. The pointed carpels of a slender conical shape more readily pierce the ground, the elongated awn curved and twisting round by changing humidity screws it beneath the soil, while every advanced movement that it makes it is prevented from retracting by the up-pointed bristles, which barb the carpel and inner surface of the awn; thus its penetration of the earth (which is mostly of a dry sandy nature) is secure, and the awn further performs the important part of attracting moisture from the atmosphere, and conducting it most faithfully to its tender charge below, until it is enabled to support itself.

The medicinal properties of the genus are of no value; *E. cicutarium* and *E. moschatum* have been employed as aromatic bitters, but their power as tonics is so feeble that they have gone out of use.

ORDER II.

DECAN'DRIA. TEN STAMENS.

GENUS II. GERA'NIUM.—LINN. *Crane's-bill*.

Nat. Ord. GERANIACE'Æ. DE CAND.

GEN. CHAR. *Calyx* of five pieces. *Stamens* ten, alternately larger, each of the larger ones bearing a *gland* at the base. *Fruit*

beaked. *Capsules* five, each with a long naked awn, curling back from the base to the point.—Name from *γέρανος* of the Greeks, and so called from *γέρανος*, a crane, from the resemblance of the capsule and awn to the head and beak of that bird.

1. *Roots Perennial.*

* *Peduncles single flowered.*

1. *G. sanguinum*, Linn. (Fig. 1080.) *Bloody Crane's-bill.* Peduncle single flowered, axillary; petals obovate, emarginate, twice as long as the bristle pointed calyx; leaves opposite, nearly orbicular, of from five to seven three-cleft lobes; stem erect, or spreading.

English Botany, t. 272.—English Flora, vol. iii. p. 242.—Hooker, British Flora, ed. 4. vol. i. p. 250.—Lindley, Synopsis, p. 58.—*G. Lancastriense*, With.—Lindley, Synopsis, p. 58.

Root long, deep, rooting, stout, woody, dark reddish brown. *Stems* mostly numerous, erect, or loosely spreading, round, branched and leafy, from one to two feet long, more or less clothed with slender horizontally spreading hairs. *Leaves* opposite, on slender petioles, orbicular, kidney-shaped, in the outline deeply five to seven lobed, each lobe three to five-cleft. *Stipules* oblong, ovate, membranous, hairy. *Flowers* solitary, large, of a fine deep crimson, or blood colour, elegantly pencilled with deeper coloured veins. *Peduncles* long, axillary, hairy. *Bractees* small, ovate. *Pedioles* from one to two inches long. *Calyx* five oblong bristle pointed pieces, three or five ribbed, hairy. *Petals* as long again as the calyx, obovate, notched. *Stamens* equal. *Filaments* awl shaped. *Carpels* even, keeled, downy. *Seeds* mostly single, dark brown, minutely wrinkled and dotted.

Habitat.—Hilly and alpine pastures in limestone districts; not common.

Perennial; flowering from July to September.

The flowers vary considerably in the intensity of their colour, according to their more or less shady and favourable situation of growth. The roots possess astringent properties, but in too small a proportion to render them of much value as a medicine. It is sometimes cultivated as a border flower, and on stony banks or rock work it is an ornamental plant; but the flowers are not sufficiently numerous amongst its deep thick foliage to be an elegant ornament of our garden borders.

** *Peduncles two flowered.*

2. *G. phæum*, Linn. (Fig. 1081.) *Dusky Crane's bill.* Peduncles two flowered opposite the leaves; corolla flat; petals sub-rotundate, unequally crenated, rather longer than the oblong bristle pointed calyx segments; stem erect; leaves five to seven lobed, the upper ones sessile; filaments ciliated at the base; carpels transversely wrinkled above.

English Botany, t. 322.—English Flora, vol. iii. p. 232.—Hooker, British Flora, ed. 4. vol. i. p. 259.—Lindley, Synopsis, p. 56.

Root thick, woody, dark brown, thickly clothed with the withered remains of the old leaves. *Stem* erect, round, slightly hairy, about two feet high, simple or branched. *Leaves* distant, three to seven, deep lobed, cut and serrated, downy, paler beneath, the lower and radical ones on long slender footstalks, the upper sessile, each with thin membranous lanceolate *stipules* at the base. *Flowers* about half an inch in diameter, the *peduncles* about an inch long from the axis of the upper leaves. *Stipules* mostly several, lanceolate, small. *Pedicles* two, about an inch long. *Calyx* of five oblong narrow pieces, with a short point, rough, and scattered over with hairs. *Petals* rather longer than the calyx, roundish, ovate, with a short downy claw, a deep dingy purplish black, white at the base, the margin waved or crenated, spreading horizontally, or reflexed at the margin. *Stamens* with awl-shaped *filaments*, ciliated at the base. *Anthers* large, yellow, oblong. *Fruit* of five *carpels*, keeled, bristly, transversely wrinkled above, and terminated in a roughish awl-shaped beak.

Habitat—Woods and thickets in mountainous districts in various parts of England and Scotland, but often the outcast of the garden.

Perennial; flowering in May and June.

The remarkable dark colour of the flowers has caused it to find a place in the flower garden, and in a sandy shady situation it blooms freely. The colour of the petals varies in intensity; they are sometimes white, and the lower leaves are occasionally found with dark brown spots near the base.

3. *G. nodo'sum*, Linn. (Fig. 1082) *Knotty Crane's-bill*. Peduncles two flowered; petals emarginate, much longer than the oblong bristle pointed three ribbed calyx segments; stem four angled; leaves opposite, the lower five, the upper three lobed, serrated; carpels downy.

English Botany, t. 1091.—English Flora, vol. iii. p. 233.—Hooker, British Flora, ed. 4. vol. i. p. 259.—Lindley, Synopsis, p. 56.

Root knotted, branched, and spreading. *Stems* mostly several, from twelve to eighteen inches high, angular, simple or branched, erect, slender, swollen about the joints, where they are usually of a pinkish colour, scattered over with pressed hairs. *Leaves* opposite, a dark shining green, paler beneath, scattered over with short close pressed hairs, the lower ones on long footstalks, of five deep acute lobes, and acutely serrated, the upper ones nearly sessile, of three lanceolate lobes. *Stipules* thin, membranous, narrow, tapering, smooth. *Flowers* about half an inch in diameter, pale purple or lilac, the *peduncles* axillary, long, slender, bearing two flowers on slender *pedicles*, the bracteus two to four, awl-shaped. *Calyx* of five

oblong bristle pointed segments, scattered over with short close pressed down, three ribbed, membranous on the margin. *Petals* much longer than the calyx, obovate, emarginate, with an elongated white claw, striated with dark purple veins. *Stamens* with awl-shaped *filaments*, ciliated on the margin. *Carpels* oblong, even, and as well as the elongated awn thickly set with short close down.

Habitat.—Thickets in the mountainous parts of Cumberland, and between Hatfield and Welwyn, Herts, but probably now extinct.

Perennial; flowering from May to August.

This plant, though always very rare, and now perhaps not found wild in England, is very common in the mountainous districts of Italy, France, Switzerland, and Germany.

4. *G. sylvaticum*, Linn. (Fig. 1084.) *Wood Crane's-bill*. Peduncles two flowered; pedicles sub-corymbose after flowering, erect; petals obovate, twice as long as the bristle pointed calyx; filaments ciliated in the lower half; carpels even; stem round, erect, keeled, and with the awn clothed with glandular pubescence; leaves of five to seven deep lanceolate cut and serrated lobes.

English Botany, t. 121.—English Flora, vol. iii. p. 234.—Hooker, British Flora, ed. 4. vol. i. p. 259.—Lindley, Synopsis, p. 56.

Root stout, dark brown, woody. *Stems* mostly several, erect, branched, round, smooth below, clothed with glandular pubescence above, leafy, from two to three feet high. *Leaves* opposite, of from five to seven deep, cut, lanceolate, lobes unequally cut and serrated, a deep green above, paler beneath, scattered over with close pressed hairs, the lower on long footstalks, the upper sessile. *Stipules* pale, membranous, lanceolate, smooth. *Peduncles* two flowered, terminating the stem and branches in sub-corymbose clusters, and like the slender *pedicels* and calyx clothed with soft spreading glandular tipped pubescence. *Bracteas* small, awl-shaped. *Calyx* of five oblong bristle pointed pieces. *Stamens* with awl-shaped *filaments*, ciliated in their lower half. *Petals* as long again as the calyx, obovate, entire, or slightly notched, of a fine light purple colour, striated with dark veins, the claw short, white and downy. *Fruit* erect, clothed with soft glandular hairs. *Carpels* ovate, even keeled, the awn long, slender, lanceolate. *Seeds* very finely dotted.

Habitat.—Woods and shady banks of rivers in mountainous districts, especially in the North of England and South of Ireland.

Perennial; flowering in June and July.

This is an extremely variable plant in size and luxuriance, and the form of the segments of the leaves and the serratures. It is readily distinguished from the following and all other of our species by its ciliated filaments.



1083

Geranium molle.



1084

Geranium sylvaticum.



1085

Geranium pratense.



1086

Geranium pyrenaicum.



1087

Geranium lucidum.



1088

Geranium robertianum.



5. *G. pratense*, Linn. (Fig. 1085.) *Blue Meadow Crane's-bill*. Peduncles two flowered; pedicles sub-corymbose after flowering, reflexed; petals obovate, twice as long as the bristle pointed calyx; filaments dilated at the base, smooth; carpels even keeled, and with the awn clothed with glandular pubescence; stem erect; leaves of five to seven lanceolate lobes, deeply cut and serrated.

English Botany, t. 484.—English Flora, vol. iii. p. 234.—Hooker, British Flora, ed. 4. vol. i. p. 260.—Lindley, Synopsis, p. 56.

Root stout, dark brown, somewhat woody. *Stem* erect, round, stout, pinkish below, and about the joints clothed with short close pressed pubescence, above glandulous and branched. *Leaves* numerous, opposite, the lower ones on long spreading channeled footstalks, spreading, the upper sessile, deeply cut into from five to seven narrow linear lanceolate lobes, deeply cut into narrow segments, and acutely serrated, dark green above, paler beneath, clothed with close pressed pubescence. *Stipules* narrow, lanceolate, membranous. *Flowers* numerous in terminal sub-corymbose clusters, much larger than the last species, of a fine blue colour, striated with purple, sometimes entirely white. *Peduncles* two flowered, long, downy, glandular above. *Pedicles* about an inch long, erect in flower, declining or reflexed in fruit, thickly clothed with spreading slender glandular pubescence. *Bractees* linear, acute, spreading. *Calyx* of five oblong acute bristle pointed segments, downy, five ribbed. *Stamens* with thread-shaped *filaments*, dilated into an ovate form at the base, quite smooth, or slightly downy. *Carpels* even, ovate, keeled, clothed with short glandular hairs, as well as the long taper pointed awn. *Seeds* dark brown, finely dotted.

Habitat.—Moist rich pastures and thickets in mountainous districts; not unfrequent.

Perennial; flowering in June and July.

The flowers of this species are extremely beautiful, and much larger than the last. In some parts of Derbyshire and Yorkshire it clothes the banks of the mountain stream, and when in full bloom none of our native plants surpass it in the beauty and elegance of its bunches of flowers. After flowering the pedicles recurve, and carry the faded flowers beneath the shade of those in full bloom as though they were conscious of their fallen state, and gave place to others of increasing beauty.

6. *G. Pyrenai'cum*, Linn. (Fig. 1086.) *Mountain Crane's-bill*. Peduncles two flowered; pedicles after flowering declining; petals twice as long as the pointed calyx, deeply notched, and bearded on each side above the claw; carpels even, and with the awn covered with close pressed pubescence; seeds smooth; stem erect; leaves kidney-shaped, five to seven lobed, each lobe three-cleft, and the lower ones crenated.

English Botany, t. 405.—English Flora, vol. iii. p. 239.—Hooker, British Flora, ed. 4. vol. i. p. 260.—Lindley, Synopsis, p. 56.

Root hard, woody. *Stem* erect, or spreading, branched, round, clothed with soft reflexed pubescence. *Leaves* numerous, dark green, covered with soft pubescence, the lower ones from two to three inches wide, deeply five to seven lobed, each lobe three-cleft, and mostly crenated, the footstalk long and downy, the upper leaves almost sessile, more acutely lobed, and seldom crenated. *Stipules* membranous, ovate, taper pointed, often jagged, hairy. *Inflorescence* terminal sub-corymbose clusters. *Peduncles* slender, two flowered. *Pedicles* erect in flower, deflexed in fruit. *Bractææ* lanceolate. *Calyx* of four ovate oblong pointed pieces, downy. *Petals* obovate, deeply cleft, a pale purple, the claw short, white, with a tuft of down on each side. *Stamens* with awl-shaped *filaments*, downy. *Carpels* ovate, keeled even, downy, as well as the awn. *Seeds* smooth.

Habitat.—Meadows and pastures in various parts of the country, but not common.

Perennial ; flowering in June and July.

The flowers are sometimes found quite white. It is nearly allied to the following species, but its perennial root, obtuse lobes of the leaves, even carpels, and smooth seeds, sufficiently distinguish them from each other.

2. *Root annual.*

* *Carpels with wrinkled valves.*

7. *G. molle*, Linn. (Fig. 1083.) *Dove's-foot Crane's-bill*. Peduncles two flowered ; pedicles after flowering declining ; petals scarcely longer than the short bristle pointed calyx, slightly bearded above the claw ; carpels transversely wrinkled ; seeds smooth ; stem spreading, downy ; leaves roundish, kidney-shaped, deeply lobed, cut, and often obtusely crenated.

English Botany, t. 778.—English Flora, vol. iii. p. 237.—Hooker, British Flora, ed. 4. vol. i. p. 260.—Lindley, Synopsis, p. 57.

Root tapering, dark brown. *Stems* numerous, prostrate and spreading, simple or branched, and, as is the whole plant, more or less clothed with soft pubescence, very variable in size and luxuriance, from three to twelve inches long, of a pinkish colour, especially about the joints. *Leaves* numerous, the radical ones on long slender spreading footstalks, the upper sessile, roundish, kidney-shaped, deeply seven to nine lobed, each lobe usually cut into three obtuse segments, and sometimes obtusely crenated, the upper lobes acutely pointed. *Stipules* thin, membranous, ovate lanceolate. *Flowers* small, numerous. *Peduncles* opposite to the upper leaves, about an inch long, slender. *Pedicles* two, shorter, erect in flower, deflexed in fruit. *Bractææ* membranous, small. *Calyx* small, downy, of five lanceolate pieces, with short obtuse bristle points. *Petals* about half as long again as the calyx, deeply notched, of a pinkish purple, the

claw slightly bearded on each side above the base. *Carpels* transversely wrinkled, smooth or downy. *Seeds* smooth, even.

Habitat.—Dry pastures, road sides, and waste places; common.

Annual; flowering from April to August.

The wrinkled valves readily distinguish this from *G. pusillum*; and the same character, together with its smooth and not rough honey-combed surface of the seeds separate it from *G. rotundifolium*.

8. *G. lucidum*, Linn. (Fig. 1087.) *Shining Crane's bill*. Peduncles two flowered; pedicles after flowering deflexed; petals obovate, entire, longer than the transversely wrinkled pyramidal calyx; carpels transversely wrinkled and netted; seeds smooth; stem erect or spreading; leaves roundish, five to seven lobed, cut and obtusely crenated.

English Botany, t. 75.—English Flora, vol. iii. p. 236.—Hooker, British Flora, ed. 4 vol. i. p. 230.—Lindley, Synopsis, p. 57.

Root small, slender, thread-shaped. *Stems* mostly numerous, much branched and spreading, smooth, shining, succulent, swollen at the joints, and readily separating, a pale green when grown in the shade, a bright blood colour when fully exposed to the sun. *Leaves* roundish, kidney-shaped, deeply five to seven lobed, obtusely crenated, sometimes cut, a shining green above, paler beneath, and sometimes scattered over with a few hairs, the radical leaves on long slender footstalks, the upper nearly sessile, opposite. *Stipules* very small, membranous. *Flowers* small, bright rose colour. *Peduncles* slender, about an inch long. *Pedicles* shorter, erect in flower, deflexed in fruit. *Bractees* very small. *Calyx* smooth, of a pyramidal shape, five angled, the valves ovate, taper pointed, three ribbed, and transversely wrinkled. *Petals* obovate, entire, longer than the calyx, the claw slender, tapering. *Carpels* ovate, transversely wrinkled, smooth. *Seeds* even.

Habitat.—Damp rocks and walls, roofs of houses, &c.; frequent in mountainous districts.

Annual; flowering from May to August.

This is an extremely pretty ornamental plant, decorating with its deep stained stems and shining leaves the rocks and mountain cottages, and covering with its gay attire the ruined mote or castle tower.

9. *G. robertianum*, Linn. (Fig. 1088.) *Stinking Crane's-bill*, or *Herb Robert*. Peduncles two flowered; pedicles after flowering erect; petals obovate, entire, as long again as the bristle pointed angular calyx; carpels transversely wrinkled; seeds smooth; stem erect, and spreading; leaves pinnate, five angled; leaflets trifid, cut and serrated.

English Botany, t. 1486.—English Flora, vol. iii. p. 235.—Hooker, British Flora, ed. 4. vol. i. p. 260.—Lindley, Synopsis, p. 57.

β. purpureum. Smaller, with glandular hairs upon the fruit ; the petals slightly notched ; leaves smaller, and more fleshy.

G. purpureum, Vill.—English Botany, Suppl. t. 2648.—*G. Raii*.—Lindley, Synopsis, p. 57.—*G. robertianum*, var. *β.* Smith.—English Flora, vol. iii. p. 235.

Root long, slender, branched. *Stems* mostly numerous, erect, and spreading, round, brittle, succulent, generally of a deep shining red colour, somewhat swollen at the joints, and more or less hairy. *Leaves* opposite, pinnate, of three or five pinnatifid stalked leaflets, each of which is serrated, and more or less deeply cut, the outline of the leaf is five angled, the lower ones on long slender hairy footstalks, the upper ones nearly sessile, a shining green above, often pinkish, paler beneath, and more or less thickly scattered over with compressed white hairs, of a somewhat fleshy texture, especially in var. *β.* *Stipules* lanceolate, membranous, mostly hairy. *Flowers* small, deep rose colour, white at the base and claw. *Peduncles* axillary, two flowered, slender, and as well as the short pedicles more or less clothed with pubescence, which is sometimes glandulous. *Bractææ* small. *Calyx* angular, hairy, of five three ribbed ovate lanceolate bristle pointed pieces. *Stamens* with awl-shaped *filaments* and purple *anthers*. *Petals* obovate, entire, or slightly notched, three ribbed, the claw slender, tapering. *Carpels* ovate, more or less deeply wrinkled and hairy. *Seeds* smooth.

Habitat.—Banks, waste and shady places, common ; var. *β.* near the sea in various places.

Annual ; flowering from May to October

The leaves of this plant have, when bruised, a remarkably disagreeable odour ; at one time it was held in great estimation as an external application in erysipelatous inflammations, cancer, old ulcers, &c. ; but it has in the cure of these diseases been succeeded by other and more successful remedies. All the species of *Geranium* secrete more or less abundantly odoriferous resins and essential oil ; indeed so abundant are these secretions in some of the tribe, as in *Sarcocaulon L'Heretieri*, that the stems are burnt like torches, and during combustion give out an agreeable fragrance ; and from the leaves and stems of *Pelargonium odoratissimum* is distilled an extremely fragrant and agreeable essential oil used in perfumery.

** *Carpels even. Seeds pitted.*

10. *G. rotundifolium*, Linn. (Fig. 1089.) *Round-leaved Crane's-bill.* Peduncles two flowered ; pedicles after flowering deflexed ; petals oblong, wedge-shaped, rather longer than the oblong short pointed pubescent calyx ; carpels even pubescent ; seeds netted ; stem spreading ; leaves roundish, kidney-shaped, downy, lobed, cut, and crenated.

English Botany, t. 157.—English Flora, vol. iii. p. 240.—Hooker, British Flora, ed. 4. vol. i. p. 260.—Lindley, Synopsis, p. 57.



1068 *Geranium rotundifolium*



1090 *Geranium dissectum*.



1091 *Geranium columbinum*.



1092 *Geranium pusillum*.



1063

Lavatera arborea.

Root tapering, slender, the whole plant clothed with soft spreading pubescence. *Stems* numerous, spreading, slender. *Leaves* numerous, opposite, and alternate, roundish, kidney-shaped, the lower ones on long slender downy footstalks, seven lobed, each lobe deeply crenated or cut, the upper ones shortly petiolated, or sessile, the teeth somewhat acute. *Stipules* ovate lanceolate, downy, membranous. *Flowers* small, numerous, pink. *Peduncles* from the axis of the upper leaves, slender, hairy, and viscid, as well as the *pedicles*, which are erect in flower, deflexed in fruit. *Bracteas* small, narrow, downy. *Calyx* of five oblong pieces, with a short obtuse point, clothed with short close down, and fringed more or less with long hairs. *Petals* oblong, wedge-shaped, entire, rather longer than the calyx. *Carpels* ovate, slightly keeled even, downy, as well as the tapering awns. *Seeds* ovate, rough, with depressed pits, or rather with elevated lines, like a fine beautiful net covering them.

Habitat.—Banks and waste places, old walls, and ruins; but not common.

Annual; flowering in June and July.

11. *G. dissectum*, Linn. (Fig 1090.) *Jagged-leaved Crane's-bill*. Peduncles two flowered; petals obcordate, longer than the ovate lanceolate bristle pointed calyx; carpels even, and with the awn hairy and glandulous; seeds netted; stem erect and spreading, hairy; leaves deeply divided into five to seven narrow lobes, and cut into narrow linear segments.

English Botany, t. 758.—English Flora, vol. iii. p. 241.—Hooker, British Flora, ed 4. vol. i. p. 261.—Lindley, Synopsis, p. 57.

Root slender, tapering. *Stems* mostly several, weak, spreading, hairy, branched and leafy. *Leaves* opposite, a dark green, paler, and more hairy beneath, the lower ones on long slender footstalks, and more or less hairy, divided to near the base into from five to seven segments, which are cut into three linear acute lobes, and these serrated, cut, or entire, the upper leaves are smaller, less divided, and with narrower more acute lobes. *Stipules* lanceolate. *Flowers* from the axis of the upper leaves, the *peduncles* angular, and as well as the *pedicles* downy and viscid. *Bracteas* narrow, lanceolate. *Calyx* rather large, clothed with thick down, the segments lanceolate, bristle pointed, three ribbed. *Petals* heart-shaped, pink, rather longer than the calyx, the claw short, white, downy on each side. *Carpels* even, slightly keeled, and as well as the awn clothed with glandular pubescence. *Seeds* ovate, rough, with elevated lines, covered over as with a fine net work.

Habitat.—Waste places, banks, and fallow fields.

Annual; flowering in May and June.

This is an extremely variable plant in size and luxuriance, according to the kind of soil and the situation in which it has grown

Sometimes it is not more than three inches long, and at others two feet. It is, however, in all its varieties readily distinguished by the above characters from the other species.

12. *G. columbinum*, Linn. (Fig. 1091.) *Long-stalked Crane's-bill*. Peduncles two flowered; pedicles after flowering spreading; petals entire, as long as the long bristle pointed calyx; carpels even, smooth; seeds netted; stem spreading, hairy; leaves deeply divided into five to seven lobes, cut into linear segments.

English Botany, t. 259.—English Flora, vol. iii. p. 241.—Hooker, British Flora, ed. 4. vol. i. p. 261.—Lindley, Synopsis, p. 58.

Root tapering, slender. *Stem* slender, branched, and spreading, and as well as the peduncles hairy, with short stiff close pressed reflexed hairs. *Leaves* numerous, opposite, a bright green, paler beneath, and more or less clothed with spreading hairs, the lower ones with long slender footstalks, divided to the base into seven narrow spreading lobes, cut into numerous linear segments, the upper ones nearly sessile, and much less divided. *Stipules* thin, membranous, awl-shaped. *Flowers* pale purple, numerous. *Peduncles* longer than the leaves, slender, the *pedicles* long, slender, erect in flower, spreading, or deflexed in fruit. *Bractees* small. *Calyx* of five, ovate, lanceolate pieces, of a pale thin texture, more or less hairy, three ribbed, terminating in a long rough bristle point. *Petals* scarcely longer than the calyx, ovate oblong, entire. *Carpels* ovate, even, smooth or downy. *Seeds* ovate, rough, with elevated lines, covering over the seeds as with a fine net work.

Habitat.—Dry sandy pastures and waste bushy places in various parts of England, but not common.

Annual; flowering in June and July.

The flowers of this species are small, but often of the most delicately shaded purple. The calyx, after flowering, becomes much larger, and closely envelopes the carpels, as it would seem, to protect them from wet and injury. It is a very variable plant as to size and luxuriance, growing from three or four inches to two or three feet in length.

*** *Carpels even. Seeds smooth.*

13. *G. pusillum*, Linn. (Fig. 1092.) *Small-flowered Crane's-bill*. Peduncles two flowered; pedicles after flowering spreading; petals small, notched, shorter than the bristle pointed calyx; carpels even downy; seeds smooth, even; stem spreading, downy; leaves rounded or kidney-shaped, divided into five to nine lobes, three or many cleft.

English Botany, t. 385.—English Flora, vol. iii. p. 238.—Hooker, British Flora, ed. 4. vol. i. p. 263.—Lindley, Synopsis, p. 57.—*G. molle*, β . Hudson.—*G. parviflorum*, Curtis.—*G. malvifolium*, Scop.

β . *humile*. Stem smaller, leaves more finely cut.

De Cand. Prod. 1. p. 643.

Root small, tapering. *Stem* slender, spreading, branched, clothed with soft pubescence. *Leaves* numerous, opposite, clothed with soft close pressed downiness, the lower ones with long spreading footstalks, roundish, kidney-shaped, deeply divided into from seven to nine wedge-shaped lobes, and mostly three-cleft, with rounded obtuse points, the upper leaves nearly sessile, not so much divided, and acutely pointed. *Bracteas* small. *Flowers* small, a blueish pink. *Peduncles* short, downy. *Pedicles* short, erect in flower, spreading, or deflexed in fruit. *Bracteas* awl-shaped. *Calyx* downy, of five ovate lanceolate three ribbed pieces. *Petals* ovate, notched, small, scarcely longer than the calyx. *Stamens* mostly only five. *Carpels* ovate, even, clothed with soft close pressed hairs. *Seeds* ovate, smooth, and even.

Habitat.—Dry sandy fields and waste places; frequent in England, less common in Scotland.

Annual; flowering from June to September.

This, like the last species, is extremely variable in its size, according to the more or less humid or favourable situation for its growth. The peduncles are short, sometimes a solitary flower is found in the axis of the leaves, but this is a rare occurrence.

ORDER III.

POLYAN'DRIA. MANY STAMENS.

GENUS III. LAVATERA.—LINN. *Tree Mallow*.

Nat. Ord. MALVACEE. BROWN.

GEN. CHAR. *Calyx* surrounded by an *involucrum*, from three to six lobed. *Fruit* of numerous one seeded *capsules*, arranged in a circle round a common axis.—Name in honour of two Lavaters, physicians of Zurich, friends of Tournefort.

1. *L. arbo'rea*, Linn. (Fig. 1093.) *Sea-tree Mallow*. Stem shrubby; leaves downy, plaited, seven angled; peduncles numerous, axillary, single flowered, much shorter than the leaf stalk.

English Botany, t. 1841.—English Flora, vol. iii. p. 248.—Hooker, British Flora, ed. 4. vol. i. p. 261.—Lindley, Synopsis, p. 41.

Root much branched, long. *Stem* erect, from three to eight feet high, round, thick, branched above into a leafy head, rough, with deflexed compound bristly hairs. *Leaves* alternate, of a greyish green colour, clothed with soft pubescence, the *footstalks* long, flexible, large, seven angled, plaited, and crenated on the margin. *Inflorescence* axillary clusters of numerous large purplish rose coloured

flowers, bright and shining, a deep purple towards the base. *Peduncles* slender, about an inch long, downy, shorter than the leaf stalk, single flowered. *Calyx* of one piece, cut into five erect acute lobes, surrounded by a larger *involucrum*, of one piece, cut into three broad spreading lobes. *Petals* five, abruptly heart-shaped, flat, and spreading, the claw short, inserted into the tube of the stamens. *Fruit* formed of from seven to fourteen compressed carpels, somewhat wrinkled at the back, ranged in a circle round the columnar axis, each carpel is formed of one cell, two valved, and bearing a single kidney-shaped seed.

Habitat.—Maritime rocks in the South and South-West of England, but rare. Islets off the coast of Anglesea; isles in the Frith of Forth; the harbour of Galway, the south isles of Arran, near Dingle, and on Ireland's Eye, and near Ballantry, Ireland.

Biennial; flowering from July to October.

This is a large branched plant, bearing numerous handsome showy flowers, which succeeding one another for a length of time, render it a valuable and ornamental plant for shrubberies, borders, &c., especially in gardens near the sea.

GENUS IV. MAL'VA.—LINN. *Mallow*.

Nat. Ord. MALVA'CEÆ. BROWN.

GEN. CHAR. *Calyx* surrounded by a three leaved *involucrum*. *Fruit* of numerous one seeded *capsules*, arranged in a circle round a common axis.—Name altered from *μαλαχνη*, *soft*: in allusion to the mild mucilaginous properties of the species.

1. *M. sylvestris*, Linn. (Fig. 1094.) *Common Mallow*. Stem erect, or ascending; leaves seven lobed; the petioles and axillary peduncles hairy, erect in fruit; corolla large, very much longer than the calyx.

English Botany, t. 671.—English Flora, vol. iii. p. 245.—Hooker, British Flora, vol. i. p. 261.—Lindley, Synopsis, p. 40.

Root whitish, tapering, branched. *Stem* erect or ascending, from one to three feet high, round, branched, leafy, and clothed with soft spreading hairs. *Leaves* a dark green, paler beneath, clothed with soft pubescence, the lower ones with long round hairy petioles, of seven rounded crenated lobes, the upper ones with shorter petioles, more acute lobes and serratures. *Inflorescence* axillary clusters of large handsome pink flowers, with deeper radiating veins. *Peduncles* slender, hairy, erect in flower and fruit. *Involucrum* of three spreading ovate lanceolate hairy pieces. *Calyx* of one piece, cut into five broadly acute lobes, hairy. *Corolla* of five spreading obcordate petals, the lobes often obliquely cut. *Fruit* numerous, *carpels* united together around a common axis, each carpel is kidney-shaped, rough, with reticulations on the margin, single seeded.



1094

Malva sylvestris.



1095

Malva rotundifolia.



1096

Malva rotundifolia v. pusilla.



1097

Malva moschata.



1098

Althaea officinalis



1099

Althaea hirsuta.

Habitat.—Waste places, road sides, &c.; common in England and Ireland; less frequent in Scotland.

Perennial; flowering from June to August.

The leaves, flowers, and tender branches of this plant, have long been used in the form of decoction for fomentation, and made into poultices for the relief of local inflammations, as well as made into a drink, in cases of fever, sore throat, &c., and it is a useful and soothing application in various cases; but as a drink its decoction is superseded by the roots of the Marsh Mallow, (*Althæa officinalis*, page 946.)

2. *M. rotundifolia*, Linn. (Fig. 1095.) *Dwarf Mallow*. Stem prostrate; leaves roundish, heart-shaped, five to seven lobed; peduncles axillary, deflexed after flowering; corolla small, as long again as the calyx.

English Botany, t. 1092.—English Flora, vol. iii. p. 246.—Hooker, British Flora, ed. 4. vol. i. p. 261.—Lindley, Synopsis, p. 40.

β. pusilla. (Fig. 1096.) Petals as small as the calyx.

β. English Flora, vol. iii. p. 246.—Hooker, British Flora, ed. 4. vol. i. p. 261.—Lindley, Synopsis, p. 40.—*M. pusilla*.—English Botany, t. 241.

Root tapering. *Stems* numerous, prostrate, mostly simple, round, or somewhat angular, clothed with close pubescence. *Leaves* alternate, dark green, paler beneath, roundish, heart-shaped, with five to seven rounded acute lobes, the *petioles* long, slender, spreading, all clothed with close pubescence. *Inflorescence* axillary clusters of pale pink flowers, each on a round slender downy *pedicle*, erect in flower, deflexed in fruit. *Involucrum* of three narrow pieces, shorter than the five acute lobed *calyx*. *Corolla* of five inversely heart-shaped *petals*, about as long again as the calyx, a pale pink, in *β*. they are about the length of the calyx, pale, almost white, and the whole plant is smaller. *Fruit* numerous, carpels united together around a common axis, covered with close downiness, each carpel is kidney-shaped, and rough, with reticulations on the back, each bearing a single kidney-shaped seed.

Habitat.—Road side and waste places; frequent.

Annual; flowering from June to September.

3. *M. moschata*, Linn. (Fig. 1097.) *Musk Mallow*. Stem erect, the radical leaves rounded, from five to seven obtuse lobes, the upper ones five partite, and cut into numerous linear segments; flowers mostly in terminal heads; peduncles and calyx hairy.

English Botany, t. 754.—English Flora, vol. iii. p. 246.—Hooker, British Flora, ed. 4. vol. i. p. 262.—Lindley, Synopsis, p. 40.

Root hard and woody. The whole plant is of a cheerful green colour, more or less thickly scattered over with simple hairs, swollen at the base, and in warm weather it exhales a musky odour. *Stem*

erect, from one to two feet high, round, or somewhat angular, simple or branched. *Leaves* numerous, the lower and radical ones rounded, of from five to seven lobes, obtuse, and acutely serrated and cut, the footstalks long. *Stipules* linear, awl-shaped, membranous, the upper leaves are divided to the base into five parts, and each part is numerous cut into narrow linear mostly waved segments. *Inflorescence* numerous flowers, congested into a terminal head, and occasionally a single flower in the axis of the upper leaves. *Peduncles* round, short, hairy, bearing a single large rose coloured flower, the *involucrum* of three linear pieces. *Calyx* rather large, pale green, cut into five broad ovate acutely pointed lobes. *Corolla* of five wedge-shaped petals, notched and waved at the end. *Fruit* numerous, carpels united together round a common axis, covered over with dense silky pubescence, each carpel is kidney-shaped, and bears a single kidney-shaped seed.

Habitat.—Meadows, pastures, and lanes in waste places; not infrequent.

Perennial; flowering in July and August.

The flowers of this species are extremely showy and beautiful, which has obtained it a place in flower gardens. The odour which is exhaled from the leaves is not very powerful, it is much more observed when the plant is gently drawn through the hand. A white flowered variety is sometimes found, which is very delicate and pretty, but not so beautiful as the more common one. About a hundred species of *Malva* are now known, all of which possess demulcent properties, from the quantity of mucilaginous matter with which the whole plant abounds. Many of them are very handsome ornamental plants, and are cultivated on that account.

GENUS V. ALTHÆA.—LINN. *Marsh Mallow*.

Nat. Ord. MALVACEÆ. BROWN.

GEN. CHAR. *Calyx* surrounded by an *involucrum*, of from six to nine lobes. *Fruit* of numerous one seeded *capsules*, arranged in a circle round a common axis, in a five lobed head.—Name *αλθω*, to cure; from its healing properties.

1. *A. officinalis*, Linn. (Fig. 1098.) *Common Marsh Mallow*. Leaves soft and downy on both sides, ovate, or heart-shaped, unequally serrated, the lower ones five lobed, and the upper three; flowers numerous in axillary clusters, shorter than the leaves.

English Botany, t. 147.—English Flora, vol. iii. p. 244.—Hooker, British Flora, ed. 4. vol. i. p. 262.—Lindley, Synopsis, p. 41.

Root long, tapering, white, the whole plant thickly clothed with a very soft starry pubescence. *Stems* usually several, about three feet

high, mostly simple, round, tough, and pliant. *Leaves* numerous, alternate, ovate, or heart-shaped at the base, the lower ones five lobed, five ribbed, and plaited, the upper ones three lobed and three ribbed, all unequally serrated on the margin. *Inflorescence* short axillary clusters, of from three to six pale pink flowers, often near the top of the stem there are one or two, sometimes sessile in the axis of the leaves. *Involute* of one piece, cut into about nine narrow acute spreading lobes. *Calyx* of one piece, cut into five broadly acute lobes. *Corolla* of five inversely heart-shaped pale pink *petals*, with broad claws attached to the tube of the stamens, very often the petals are obliquely cut on one side. *Stamens* very numerous. *Style* cylindrical, with about twenty bristle-shaped stigmas. *Fruit* with as many capsules as there are stigmas, arranged round a common axis. *Capsules* kidney-shaped, single seeded.

Habitat.—Marshy places, mostly near the sea; not unfrequent in England and Ireland; Solway Frith, and near Campsie, Scotland.

Perennial; flowering from July to September.

Marsh Mallow has long been in use, and esteemed for the demulcent and emollient properties with which it abounds, and is used beneficially in coughs, hoarseness, catarrh, dysentery; and affections of the urinary organs. For these affections the root is sliced or bruised, and two ounces of it boiled in three pints of water until it is reduced to two, and to this is added with advantage an ounce of gum Arabic, and it may be sweetened with candied sugar or Spanish juice. The leaves are often also used with benefit, when well boiled and bruised and formed into a poultice, in various local inflammatory affections, and also in the form of fomentations, to inflamed eyes, &c. Marsh Mallow is a very favourite remedy for numerous and various affections on the Continent. The *pate de qui-mauve* is an agreeable demulcent, and a very general form among the French for administering this remedy.

2. *A. hirsuta*, Linn. (Fig. 1099.) *Hispid Marsh Mallow*. Leaves crenated, rough, with spreading hairs, the lower ones kidney-shaped, and five lobed, the upper ones palmate, and the uppermost three lobed, acute; peduncles single flowered, larger than the leaves; calyx and involucre with taper pointed lobes.

English Botany, Suppl. t. 2674.—Hooker, British Flora, ed. 4. vol. i. p. 202.—Lindley, Synopsis, Supp. p. 320.

Root long, slender, tapering. *Stems* mostly several, spreading or ascending, round, simple, rarely branched, clothed with spreading bristly hairs. *Leaves* not very numerous, distant, alternate, a darkish green, paler beneath, and more or less rough, with rough spreading hairs, the lower leaves roundish, kidney-shaped, obtusely five lobed, and coarsely crenated, the upper ones more deeply lobed in a palmate manner, and uppermost ones deeply three lobed, acute and serrated, the lower on long slender rough footstalks, the upper

sessile. *Stipules* ovate lanceolate, hispid. *Inflorescence* solitary flowers, on long slender rough peduncles from the axis of the upper leaves. *Involucre* of nine narrow linear lanceolate hispid spreading pieces. *Calyx* of five ovate lanceolate very rough spreading pieces, often tinged with purple. *Corolla* of five obcordate spreading petals, of a lilac or deep rose colour, united at the base by their claws. *Fruit* of numerous carpels, united round a common axis.

Habitat.—Fields and waste places; rare. A field near Cobham.—*Mr. J. Rayer*. Between Cobham and Cuxton.—*Prof. Henslow*.

Annual; flowering in June and July.

This species, though found only in the above stations in England, and there probably introduced and become naturalized, is not uncommon in various parts of the Continent, especially in corn fields.

The natural order *Malvaceæ* is one of considerable interest, from its very valuable and important productions, and many of the tribes are handsome ornamental plants; as the *Althæa*, or Holly-hock, which now, much cultivated, furnishes innumerable varieties of its handsome flowers to the careful cultivator. The *Hibiscus* is a beautiful ornamental plant, and many of the varieties, as the *H. arboreus*, *cannabinus*, and *mutabilis*, have such tough pliant stems, as to be manufactured into ropes, whips, &c; and the leaves of the two former are used as food, as well as those of *H. esculentus*, whose fruit is much esteemed in the Levant. Several species are highly aromatic, others furnish dyes; while the *H. manihot* abounds in a mucilaginous substance, used as a size in Japan. The bark of the *Pariti*, of Malabar, (*H. tiliaceus*), is spun into cords, and woven into cloth, matting, &c.; and Forster states that when the crop of bread fruit fails in New Caledonia, the inhabitants use this bark as a substitute. But the most important of all the tribes in this order is the *Gossypium*, or cotton plant, the pods of which are filled with seeds, enveloped in a white down, which is the cotton of commerce. The *G. herbaceum* is the common cotton plant of the Old World, and the *G. Barbádense* of the New World. There are other species which furnish the same valuable production, but these two are the more generally cultivated. The immense value of the seed down of these plants is incalculable, when it is considered the staple commodity and almost bond of union between England and the United States of America; the immense capital invested in this article in its growth and manufacture, the vast number of people it employs in various ways, from its growth to the completion of the great variety of beautiful and invaluable articles into which it is manufactured by the ingenuity of man, startles and astonishes us that the simple downy covering of the seeds of these humble plants should become the instrument of so much wealth, and acquire so vast an importance. It is probable that in this article and its manufacture in Great Britain alone, there is invested a capital of not less than £100,000,000, which gives employment to 1,000,000 of





1100

Corydalis solida.



1101

Corydalis lutea.



1102

Corydalis claviculata.



1103

Fumaria capreolata.



1104

Fumaria officinalis.



1105

Fumaria parviflora.

our population, to say nothing of the wonderful power of machinery ; but for much curious information upon this article see Ure's work on the Cotton Manufactories.

CLASS XVII.

DIADEL'PHIA.

(*Filaments combined in two sets, except in the first division of third order.*)

ORDER I.

HEXAN'DRIA. SIX STAMENS.

GENUS I. CORYDALIS.—DE CAND. *Corydalis*.

Nat. Ord. FUMARIA'CEÆ. DE CAND.

GEN. CHAR. *Calyx* of two small pieces, or wanting. *Petals* four, free or united, one of which is spurred at the base. *Siliqua* compressed, two valved, many seeded.—Named from *κορυδαλίσ*, the ancient Greek name for Fumitory, from which genus this has been separated.

1. *C. so'vida*, Hook. (Fig 1100.) *Solid-rooted Corydalis*. Root tuberos, solid ; stem erect, simple, with a scale beneath the lower leaf ; leaves biternate ; leaflets wedge-shaped, or oblong, cut, the segments obtuse ; bractees palmate, with linear segments ; pedicles equal, or longer than the capsules.

Fumaria solida, Linn.—English Botany, t. 1471.—English Flora, vol. iii. p. 253.—*F. Halleri*, Willd.—Hooker, British Flora, ed. 4. vol. i. p. 265.—*C. bulbosa*, De Cand.—Lindley, Synopsis.

Bulb orbicular, depressed, solid. *Stem* erect, simple, rarely branched, angular, from six to twelve inches high, leafy, the lower petiole dilated into a membranous sheath, leafless. *Leaves* a glaucous green, smooth, spreading, the petiole slender, fleshy, brittle, divided into three branches, each of which is again divided into three, and bearing a leaflet, cut into three segments, and obtusely crenated. *Inflorescence* a terminal raceme of numerous variegated purplish inodorous flowers. *Bractees* large, wedge-shaped, cut into linear obtuse segments. *Pedicles* slender, nearly as long as the bractees. *Calyx* very small, two rounded scales. *Corolla* irregular, of four unequal petals, united, the upper one with an obtuse notched reflexed limb, the base elongated into an obtusely pointed spur, the lower lip

of three lobes, the two outer ones linear; ovate, obtuse. *Stamens* six, the filaments united in two sets. *Fruit* a two valved many seeded pod.

Habitat.—Groves and hedges; at Kendal and other parts of Westmoreland; Perry Hall, near Birmingham; Wickham, Hampshire. A very doubtful native.

Perennial; flowering in April and May.

This is a commonly cultivated plant in groves, shady places, &c., and from thence has probably escaped and become naturalized. It is rather singular looking when in flower, from the corolla having the form of a small bird sitting upon a slender branch. It varies in colour from a deep to a pale purple, the lower lateral petals have a deep reddish purple spot near the apex.

2. *C. lu'tea*, *De Cand.* (Fig. 1101.) *Yellow Corydalis*. Root fibrous; stem angular, erect, branched; leaves bipinnate; leaflets ovate, wedge-shaped, cut, or trifid; bractees linear, one-third the length of the pedicle; pods linear, cylindrical, shorter than the pedicle; seeds shining, finely granulated.

Hooker, *British Flora*, ed. 4. vol. i. p. 265.—Lindley, *Synopsis*, p. 19.—*C. capnoides*, β . *lu'tea*.—*De Cand. Prod.* 1. p. 129.—*Fumaria lu'tea*.—*English Botany*, t. 588.—*English Flora*, vol. iii. p. 252.

Root fibrous. *Stem* erect, about a foot high, smooth, angular, brittle, simple or branched, mostly of a pinkish colour. *Leaves* mostly numerous, with angular footstalks and branches, a glaucous green, paler beneath, bipinnate, the leaflets ovate, wedge-shaped, cut, and mostly of three roundish acute lobes. *Inflorescences* terminal racemes of numerous yellow flowers. *Bractees* small, linear, membranous, about one-third the length of the pedicles. *Calyx* of two ovate lanceolate membranous pieces, soon falling away. *Corolla* with the upper lip acutely pointed, the margins reflexed, the base with a short obtuse spur, the lower lip of three pieces, the middle one spatulate, with a waved margin, the lateral ones oblong, lanceolate, all of a deeper yellow colour near the apex. *Fruit* a linear cylindrical pod, shorter than the pedicle. *Seeds* shining, rough, with granulations.

Habitat.—Old walls and ruins; near Castleton, Derbyshire; Fountains Abbey, Yorkshire.

Perennial; flowering in May.

This species, probably an outcast of gardens in our country, is not unfrequent in the crevices of rocks and mountains, and on old walls in Switzerland, the Tyrol, and the more elevated parts of Italy; it is an extremely pretty ornamental plant, and makes a good border flower in poor dry or stony situations, and flourishes well on ornamental rock work, &c.

3. *C. Claviculata*, De Cand. (Fig. 1102.) *White climbing Corydalis*. Root simple ; stem slender, much branched, climbing ; leaves pinnate ; leaflets entire, ovate, acute, ternate or pedate, on a slender footstalk, the common footstalk terminating in a branched tendril ; bractæas oblong, acuminate, longer than the very short pedicles.

Hooker, British Flora, ed. 4. vol. i. p. 265.—Lindley, Synopsis, p. 19.—*Fumaria claviculata*, Linn.—English Botany, t. 103.—English Flora, vol. iii. p. 253.

Root slender, simple. *Stems* mostly several, slender, angular, branched, from one to about three feet long, brittle, mostly of a pinkish colour, climbing by attaching itself to other plants by its branched tendrils terminating the common leaf stalks. *Leaves* pinnate, alternate, the pinnæ several, the footstalks slender, spreading, the leaflets entire, ovate obtuse, or ovate acute, ternate or pedate, a glaucous green, paler beneath. *Inflorescence* erect or spreading racemes, opposite to the leaves, the flower stalk about an inch and half long, terminated with about ten elegant delicate white flowers, variegated with blue or grey, each on a very short *pedicel*, the *bractæa* oblong, acuminate, entire, or toothed, longer than the pedicles. *Calyx* small, toothed. *Corolla* with the upper lip reflexed, the base elongated into a short obtuse spur. *Fruit* ovate, acute, or lanceolate, smooth pods, containing from two to four roundish ovate compressed black polished seeds.

Habitat.—Bushy and shady places, in a light soil, and amongst stones.

Annual ; flowering in June and July.

The delicate flowers of this species are mostly white, the tips of the petals generally variegated with blue ; sometimes they are a pale yellow, and occasionally pale yellowish green. It is a delicate and very pretty plant, and often a great ornament to the roofs of houses and old walls and ruins in the Highlands of Scotland.

GENUS II. FUMARIA.—LINN. *Fumitory*.

Nat. Ord. FUMARIACEÆ. DE CAND.

GEN. CHAR. *Calyx* of two pieces. *Petals* four, one of them spurred or gibbous at the base. *Siliqua* indehiscent, one seeded, nut like. *Style* deciduous.—Name from *fumus*, *smoke*, by the old herbalists, as they said the acrid juice of the plants made the eyes weep as smoke does.

1. *F. capreolata*, Linn. (Fig. 1103.) *Ramping Fumitory*. *Calyx* sepals broadly ovate, toothed at the base, half as long as the corolla ; fruit roundish, obtuse ; racemes lax, its pedicles spreading, or reflexed in fruit ; bractæas linear, about one-third shorter than the fruit-bearing pedicles ; leaflets with ovate or oblong segments.

English Botany, t. 943.—English Flora, vol. iii. p. 258.—Hooker, British Flora, ed. 4. vol. i. p. 265.—Lindley, Synopsis, p. 19.

Root tapering, slender, the whole plant smooth, and somewhat glaucous, often of a yellowish green colour. *Stems* slender, climbing, or spreading, branched. *Leaves* numerous, bipinnate, their footstalks long, slender, twisting round other plants, and so climbing three or four feet high; sometimes the leaf stalks terminate in slender-branched tendrils; *leaflets* mostly ovate, or oblong, sometimes ovate lanceolate. *Inflorescence* erect racemes, opposite the upper leaves, the stalk from one to two inches long, lax in fruit, with the *pedicles* spreading or reflexed, the *bracteas* pale, thin, membranous, linear, about one-third less than the pedicles. *Flowers* rather large, pale pink, the petals tipped with dark red. *Calyx* of two broadly ovate acute pieces, mostly with a tooth or dilatation on one side at the base, pale, and about half as long as the corolla, *petals* unequal, the two lateral ones linear, the lower one narrower, and mostly rather shorter, the upper as wide again, concave, and enlarged at the base into an ovate obtuse spur or pouch. *Fruit* roundish, somewhat compressed, obtuse, and slightly indented on each side of the base of the deciduous style. *Seed* solitary, smooth.

Habitat.—Waste and cultivated places; not uncommon.

Annual; flowering from May to August.

This is a very variable plant, both as regards its size and appearance, from the circumstance that its stem is sometimes not more than a foot long, and scarcely branched, and at others it is three or four feet long, and much branched and slender; and the leaves vary in size and form, and are either with or without branched tendrils, but simply twist round other adjacent plants, and thus support themselves. The true characters which distinguish this as a species, are its enlarged calyx segments, the shape of its fruit, and its spreading or reflexed fruit-bearing pedicles.

2. *F. officinalis*, Linn. (Fig. 1104.) *Common Fumitory*. Calyx sepals ovate lanceolate, acute, toothed, about one-third the length of the petals; fruit broadly ovate, globose, compressed, truncated, and sub-emarginated; bracteas small, two or three times shorter than the fruit-bearing pedicles; leaves with linear oblong segments.

English Botany, t. 589.—English Flora, vol. iii. p. 254.—Hooker, British Flora, ed. 4. vol. i. p. 266.—Lindley, Synopsis, p. 19.

β. media. "Stem diffuse, or climbing, green, the leaflets broad.—Arn. MSS.—*F. media*.—De Cand." Prod. 1. p. 180.—Hooker, British Flora.

Root slender, tapering. *Stem* erect, branched, and spreading, or climbing, smooth, angular, very variable in size and luxuriance, and glaucous green, or sometimes green, and not glaucous, as is the whole plant. *Leaves* alternate, bi- or tri-pinnate, the footstalks long, slender,

often twisting themselves round other plants, leaflets wedge-shaped, cut into three or five lanceolate acute or obtuse segments. *Inflorescence* erect racemes opposite the leaves. *Flowers* numerous, pale pink or rose colour, with much darker spots at the tips of the petals. *Calyx* of two small ovate lanceolate membranous sepals, finely toothed on each side, about one-third the length of the petals. *Bracteas* linear, shorter than the erect or slightly spreading fruit-bearing pedicles. *Fruit* broadly ovate, globose, the sides somewhat compressed, and the end truncated, and somewhat notched, mostly roughish, with elevated points. *Seeds* solitary, smooth.

Habitat.—Fields, road sides, and cultivated grounds; common.

Annual; flowering during the summer months.

This is also an extremely variable plant, and the characters most constant which distinguish it, are its calyx segments, and their relative proportion to the petals, and the form of the fruit. The racemes are mostly very long, bearing numerous flowers, arising almost from the base.

The leaves of this plant have been used medicinally; they are somewhat succulent, almost without odour, but have a bitterish saline taste. They were either dried and made into an infusion, or the juice of the fresh leaves was administered. In cases of various disorders of the skin it was thought to be useful, but it is now almost entirely out of repute.

3. *F. parviflora*, Lam. (Fig. 1105.) *Small-flowered Fumitory*. Calyx sepals very minute toothed; fruit globose, with a slight point; bracteas as long or longer than the fruit-bearing pedicle; leaves with narrow almost linear segments.

English Botany, t. 590.—English Flora, vol. iii. p. 255.—Hooker, British Flora, ed. 4. vol. i. p. 266.—Lindley, Synopsis, p. 19.

β. leucantha. "Flowers white, tipped with dark purple; leaves glaucous."

"Arn. MSS.—*F. parviflora*, De Cand.—*F. leucantha*, Vw."—Hooker, British Flora.

Root small, tapering. *Stem* erect, branched, and spreading, green, or more or less glaucous. *Leaves* alternate, bi- or tri-pinnate, the footstalks stout at the base, slender upwards, leaflets all narrow, linear, equal, and somewhat channeled. *Inflorescence* erect racemes, opposite to the leaves. *Flowers* numerous, pale pink or white, all tipped with dark purple spots. *Calyx* of two very small ovate acute membranous sepals, finely toothed on each side. *Bracteas* pale, membranous, as long and mostly longer than the fruit-bearing pedicles. *Fruit* globose, roughish, with elevated points, and the apex pointed with the base of the style. *Seeds* solitary, smooth.

Habitat.—Fields, rare; *α.* Woldham, near Rochester, and near Epsom, Hill side North of Carlton Hill, Edinburgh; *β.* Brookham, Surrey, and the Hermitage, near Leith.

Annual; flowering from August to September.

ORDER II.

OCTAN'DRIA. EIGHT STAMENS.

GENUS III. POLY'GALA.—LINN. *Milkwort*.

Nat. Ord. POLYGA'LEÆ. Juss.

GEN. CHAR. *Calyx* of five pieces, persistent, the two inner ones usually larger winged and coloured. *Petals* three or five, attached by their claws to the tube of the filaments, the lower one keeled. *Capsules* compressed. *Seeds* downy, crested at the hilum.—Name from πολυ, *much*; and γαλα, *milk*; so called from its supposed property in producing that secretion.

1. *P. vulgaris*, Linn. (Fig. 1106.) *Common Milkwort*. Keel crested; racemes terminal, many flowered; wings of the calyx three nerved, about as long as the corolla; stems simple, herbaceous, ascending; leaves linear lanceolate, or oblong lanceolate.

English Botany, t. 76.—English Flora, vol. iii. p. 257.—Hooker, British Flora, ed. 4. vol. i. p. 266.—Lindley, Synopsis, p. 39.

β. lower leaves broader.

P. amara.—English Botany, Supp. t. 2764.—Lindley, Synopsis, Supp. p. 320.

Root fibrous, tough, and woody, the whole plant smooth, of a dark shining green. *Stems* mostly several from the same root, simple, from three to six or eight inches high, ascending, occasionally branched, leafy, angular. *Leaves* scattered, those of the stem linear lanceolate or oblong lanceolate, the radical one broader, ovate lanceolate, with a short footstalk. *Inflorescence* a simple terminal raceme of numerous flowers, of a deep or pale blue, pink or white, each on a short *pedicle*, with a small *bractea*, formed of three scales. *Calyx* of five unequal pieces, the three outer ones small, ovate lanceolate, the two inner ones large, forming wings of an ovate acute or elliptic ovate form, three ribbed, the outer ribs branched, with numerous slender veins from its outer edge, terminating in the margin. *Corolla* of three petals, about as long as the wings of the calyx, the lateral ones oblong, plane, the central ones keeled, its margin at the end cut into small fringe-like segments, forming a crest. *Stamens* with membranous filaments, united into a tube split towards the top. *Style* short. *Stigma* two lipped. *Capsules* enveloped in the persistent calyx, two celled, two valved, compressed, almost orbicular, notched at the top, and contracted into a short pointed base, the margin membranous. *Seeds* downy, the hilum crested, succulent.

Habitat.—Dry hills and pastures; frequent.

Perennial; flowering in June and July.

This pretty little plant is very variable in the colour of its flowers, sometimes they are an extremely deep fine blue, and they vary to a



1106

Polygala vulgaris.



1107

Ulex europaeus.



1108

Ulex nanus.



1109

Genista tinctoria.



1110

Genista pilosa.



1111

Genista anglica.

very pale blue, and almost white ; others are not unfrequently found of a deep pink, and these vary to a faint pink blush and almost white. The leaves are somewhat bitter and stimulating, and mixed with other fodder seems to be much relished by cattle, from which circumstance it may not be improbable that it has obtained its name of Milkwort, as by its stimulating and provoking the appetite of the cattle, it will consequently produce a more abundant and healthy lacteal secretion. Many of the species of this genus are handsome and highly ornamental plants, flowering freely, and remaining in bloom a considerable time. Some of them are valuable medicines, and others furnish a kind of dye, as the *P. tinctoria*, found in Arabia, and used by the natives as a kind of indigo. The *P. senega*, or snake root, is the only species which has found its way into general use as a medicine in this country. It is a native of Virginia, and employed by the natives as a cure for the bite of the rattle snake, hence its common name. It was first brought into notice as a medicine in pectoral affections by Dr. Tennant, and has since been used with considerable success as an expectorant in cases of asthma, attended with difficult expectoration ; no medicine in such affections is more useful than a decoction of its roots administered in the dose of an ounce every two hours. The active properties of the root are found from the elaborate analysis of M. Queveune, to reside in an acrid which he has called the *Polygalic acid*. It was first obtained, but in an impure state, by Gehlen, and described by him under the name of *senegin*. Polygalic acid was administered internally to a small sized dog to the extent of two grains, when it produced vomiting, and four grains caused its death in three hours after administration. The *P. vulgare*, Milkwort, has properties similar to this, but in a much diminished degree. Its action seems to be that of a stimulant to the mucus membrane of the stomach and bowels, and the intimate connection and sympathy between this and the mucus membrane lining the air passages, is the benefit that is derived from its administration in diminished secretions of that organ.

ORDER III.

DECAN'DRIA. TEN STAMENS.

GENUS IV. U'LEX.—LINN. *Furze*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN CHAR. *Calyx* of two pieces, with a small scale on each side at the base, the upper lip with three and the lower with two teeth.
Stamens monodelphous *Legume* turgid, one celled, two valved,

ovate oblong, scarcely longer than the calyx.—Name of doubtful origin. According to Theis it is derived from *eo*, or *ao*, a sharp point, in Celtic; from whence also it is said the French name *ajonc*, or *ajonc*, a sharp or spiny rush, is derived.

1. *U. Europaëus*, Linn. (Fig. 1107.) *Common Furze, Whin, or Gorse*. Calyx teeth obsolete; bracteas ovate, lax, much wider than the peduncle; branchlets erect; leaves linear, acuminate into a pungent point.

English Botany, t. 742.—English Flora, vol. iii. p. 264.—Hooker, British Flora, ed. 4. vol. i. p. 266.—Lindley, Synopsis, p. 77.

β. minor. Branches compact, upright, soft.

Hooker, British Flora, ed. 4. vol. i. p. 267.—*U. strictus*.—Mackay's Cat. of Irish Plants, Lindley's Synopsis, Supp. p. 322.

Roots long, deep. *Shrub* from two to six feet high, much and densely branched, upright, green, rough and rigid, furrowed, and mostly downy, terminating in a stout spine, and thickly beset on all sides with short branchlets, a simple rigid spine, or bearing several smaller lateral ones. *Leaves* few, very minute, lanceolate, hairy, soon falling away. *Flowers* numerous, solitary, or in pairs from the axis of the lateral spines, a bright golden yellow, with a peculiarly heavy oppressive odour. *Peduncles* short, bearing near the calyx a pair of broad ovate scaly downy bracteas, as wide again as the peduncle. *Calyx* of two densely downy concave pieces, the teeth so closely united as to appear wanting. *Legume* downy, turgid, bursting with a sudden elastic force in hot weather; in bursting they make a crackling noise, and scatter the seeds to a considerable distance.

Habitat.—Heathy places, especially in a sandy or gravelly soil.

Shrub; flowering early in the spring, and occasionally all the summer.

Furze, or as it is called in some parts of the country Whin, or Gorse, is a very rigid, rough inhospitable looking bush, growing abundantly in most of the heathy waste lands of England, especially in a dry sandy or gravelly soil. Its wood is hard and compact, and together with its spiny branches it is cut and kept in store for winter fuel, and in a few minutes it makes an excellent hot cheerful fire. As an ornamental shrub, few surpass it in the beautiful fine bright colour of its numerous flowers, and few plants in the wild situations of its growth continue in flower so long as it does. In some parts of the country it is used to make fences. It is extremely patient of pruning and trimming; but unless it is fully exposed at the bottom, its branches become naked and barren, and it is no further a barrier to sheep. It is, perhaps, more commonly used for the purpose of fences in Ireland than England; and although it requires a larger portion of land to make a good fence than the common thorn, it is, nevertheless, there preferred, as its old branches not only supply a useful fuel, (if, however, it is cut for this purpose oftener than once in four

years the plants are too much weakened), but its young tender tops are clipped and given as food to horses, &c. The furze, when full grown, affords the best protection of all other plants, from the inclemency of the weather, as the rain is not, except in violent storms, and scarcely then, driven through it, and from its branches there are no droppings, a circumstance owing to its innumerable spines of attraction pointing upwards, and these and its branches are channeled, to conduct the rain to its roots! Though a plant so common and neglected as it is with us, it is much prized in the garden and greenhouse of many other countries, and is cultivated with great care, and considered a valuable addition to their cultivations. The variety β . commonly known in gardens as the Irish Furze, or Whin, is remarkable for its less rigid branches, and more compact mode of growth; it seldom produces flowers, but is readily propagated by cuttings, as is also a double flowered variety, which some years since was found wild in Devonshire.

2. *U. nanus*, Forst. (Fig. 1108.) *Dwarf Furze*. Calyx with lanceolate spreading teeth; bractees minute, close pressed, the width of the peduncle; branches reclining; leaves awl-shaped, hairy.

English Botany, t. 743.—English Flora, vol. iii. p. 265.—Hooker, British Flora, ed 4. vol. i. p. 267.—Lindley, Synopsis, p. 77.

Root tough and wiry. *Shrub* from one to two feet long, slender, its branches slender, reclining, clothed with soft pubescence, its branchlets slender, spiny, furrowed, simple or branched, spreading, becoming recurved. *Leaves* minute, awl-shaped, soon falling away, ribbed and downy. *Flowers* small, pale yellow. *Peduncle* slender. *Bractees* small, close pressed, not wider than the peduncle, scarcely discernible. *Calyx* yellow, ribbed, scarcely downy, its teeth slender, lanceolate, awl-shaped, spreading. *Legume* lanceolate, downy, turgid.

Habitat.—Dry heaths in various parts of England and Ireland, but much less common than the preceding species.

Shrub; flowering from August to October.

This is readily distinguished from the preceding species by its smaller size, distinct spreading lanceolate teeth of the less downy and yellower calyx, the minute bractea, and the flowers are mostly clustered towards the end of the branches, and not scattered upon them, as in the last species.

GENUS V. GENIS'TA.—LINN. *Green-weed*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* two lipped, the upper lip in two deep segments, the lower three toothed. *Keel* oblong, straight. *Stamens* monodelphous. *Style* subulate, ascending. *Legumes* flat, compressed,

or rather turgid, many seeded.—Name from *gen*, a *small shrub*, in Celtic.

* *Stem unarmed.*

1. *G. tinctoria*, Linn. (Fig. 1109.) *Dyer's Green-weed*, *Wood-waxen*. Stem unarmed; branches erect, green, striated, with elevated lines, smooth below, downy above; leaves lanceolate, the margins pubescent; stipules awl-shaped, minute; flowers racemose; corolla and legume smooth.

English Botany, t. 44.—English Flora, vol. iii. p. 262.—Hooker, British Flora, ed. 4. vol. i. p. 267.—Lindley, Synopsis, p. 77.

Root woody, slender, widely spreading its branches. *Shrub* from one to two feet high, stem round, smooth, ascending, putting up numerous erect green branches, striated with elevated lines, quite smooth, except towards the top it is scattered over with close pressed pubescence. *Leaves* of a deep shining green, lanceolate, nearly sessile, smooth, with a prominent mid-rib on the under side, and the margin rough, with pubescence. *Inflorescence* a terminal raceme of numerous crowded pale yellow *flowers*, each arising from the axis of a small leaf, the *peduncles* short, with a pair of small awl-shaped *bractees* at the base of the calyx, smooth. *Calyx* smooth, angular, its teeth deeply cut. *Corolla* smooth, the keel as long as the vexillum. *Legume* nearly cylindrical, containing numerous seeds.

Habitat.—Dry pastures, thickets, and borders of fields frequent; in England and the lowlands of Scotland, and between Killiney Hill and Bray, Ireland.

Shrub; flowering in July and August.

The Dyer's Green-weed, or Whin, is frequently used to produce a yellow dye, and it is often mixed with woad, (*Isatis tinctoria*), when the wool is intended to be dyed a green colour. The whole plant has a bitter unpleasant taste, which is said to be communicated to the milk and butter of the cows, which feed upon it in pastures when it grows in too great abundance, in which case its overgrowth must be prevented by destroying the plants. The seeds will produce both vomiting and purging if taken in large doses, but a drachm and a half of them powdered is said to act as a mild aperient. The small twigs and tops made into a decoction are said to be a useful diuretic, and have been found useful in some dropsical affections; but as a medicine it is scarcely ever employed.

2. *G. pilosa*, Linn. (Fig. 1110.) *Hairy Green-weed*. Stem unarmed, procumbent; leaves in clusters, oblong lanceolate, those under side the branches, peduncles, and calyx, clothed with close pressed silky hairs; flowers axillary, the keel and vexillum silky; legume downy.

English Botany, t. 208.—English Flora, vol. iii. p. 262.—Hooker, British Flora, ed. 4. vol. i. p. 267.—Lindley, Synopsis, p. 77.

Root of long slender wiry branches. *Stems* tortuous, numerous, round, much branched and scarred, smooth, putting up numerous slender striated twigs, clothed with close pressed silky hairs, and beset with fascicles of *leaves*, of an oblong lanceolate or oblong shape, smooth above, covered beneath with silky pubescence. *Inflorescence* axillary flowers towards the end of the branches, the *peduncles* as well as the striated calyx silky. *Corolla* small, bright yellow, the keel and vexillum silky. *Legume* oblong, somewhat compressed, silky. *Seeds* few.

Habitat.—Dry sandy or gravelly downs and heaths; about Bury, Suffolk; on the forest by the road side from Maresfield to Groombridge, Sussex; near the Lizard, Cornwall; foot of Cader Idris, North Wales.

Shrub; flowering in May, and again in September.

** *Stem spinous.*

3. *G. Anglica*, Linn. (Fig. 1111.) *Needle Green-weed*, or *Petty-whin*. Stem spinous, and without leaves below the flowering branches, smooth, leafy, and unarmed; leaves ovate lanceolate; flowers racemose; bractes leafy, longer than the peduncle; legume smooth, the apex hooked with the indurated base of the style.

English Botany, t. 132.—English Flora, vol. iii. p. 263.—Hooker, British Flora, ed. 4. vol. i. p. 267.—Lindley, Synopsis, p. 77.

Root of long spreading slender branches. *Stem* declining, round, much branched, and thickly beset with sharp slender simple rarely branched spines, which are the small branchlets of the preceding year. The terminal branchlets are clothed with leaves and flowers. *Leaves* ovate lanceolate, small, smooth, a somewhat glaucous green, the small ones linear, acute. *Inflorescence* axillary solitary flowers from the bosom of the upper leaves. *Peduncles* round, slender, smooth, as well as the calyx. *Bractea* roundish, ovate, leafy, on a short stalk. *Calyx* teeth deep cut and spreading. *Corolla* yellow, becoming greenish by drying, the keel much longer than the vexillum. *Legume* smooth, ovate, turgid, hooked with the persistent base of the style. *Seeds* several, shining, black.

Habitat.—Heaths and moory ground; not unfrequent.

Shrub; flowering in June.

GENUS VI. CYTISUS.—LINN. *Cytisus*, or *Broom*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* two lipped, the upper lip mostly entire, the lower one slightly three toothed. *Vexillum* ovate, large, keel very blunt. *Stamens* monodelphous. *Legumes* compressed, flat, many seeded.—Name *κυτίσις*, of the ancient Greeks; and

according to Pliny, so called on account of its having been brought from Cythnos, one of the Cyclades.

1. *C. scoparius*, Link. (Fig. 1112.) *Common Broom*. Branches angular, smooth; leaves ternate, stalked, the upper ones simple; leaflets oblong; flowers axillary, solitary; pedicles short; legumes hairy on the margin.

Hooker, British Flora, ed. 4. vol. i. p. 267.—Lindley, Synopsis, p. 77.—De Cand. Prod. 2. p. 154.—*Spartium scoparium*, Linn.—English Botany, t. 1339.—English Flora, vol. iii. p. 260.—*Genista scoparia*, Lam. dict.

A *shrub*, from three to eight feet high, its branches numerous, long, straight, angular, smooth, tough and pliant, its bark a dark green colour. *Leaves* scattered, ternate, stalked, the upper ones mostly simple, clothed with silky pubescence when young, *leaflets* equal, obovate, obtuse, entire. *Inflorescence* solitary, or in pairs, axillary flowers. *Flowers* numerous towards the top of the branches. *Pedicles* round, smooth, slender, drooping. *Calyx* of two obtuse lips, the upper one entire, the lower three toothed, the lateral ones converging inwards. *Corolla* large, handsome, of a bright yellow colour, sometimes tinged with orange, the *keel* broad, obtuse, the *veillum* large, ovate, and the wings spreading. *Filaments* all united into a tube, but soon split, as the germen enlarges. *Legume* large, compressed, dark brown, the sides almost smooth, with the margins fringed with rough hairs.

Habitat.—Dry sandy hills, thickets, and bushy places; frequent. Shrub; flowering in May and June.

Broom and its allied species appear to have been favourite plants with the Greeks and Romans. Its flowers were esteemed among the favourites of bees. Aristomachus says, that wherever the plant which they called Cytisus grows, there is no fear of the bees leaving their hives: and such an authority we cannot doubt, for it is stated by Pliny that he was so fond of bees that he devoted fifty-eight years of his life in raising swarms. He also extolled the value of this plant in pastures, as producing better milk, and as a preservative against all kinds of diseases in cattle; and that where it grew, the cattle, with a less quantity of food, in a very short time became much fatter than when fed in better pastures. The twigs and leaves of the Broom are bitter and tonic, while at the same time they contain a large proportion of alkaline salt: so that while they provoke the appetite, and stimulate the digestive organs, they excite the secretory glands to greater exertion to carry off the superfluous fluids: and a decoction made of the twigs and leaves will, no doubt, have the same effect upon the human body, and influence the lacteal secretion. It has been used in this form in cases of dropsy, and sometimes with great success. The bark contains so large a proportion of tannin that it is said to be capable of tanning leather. The unexpanded flower buds



1112

Cytisus scoparius.



1113

Ononis arvensis.



1114

Anthyllis vulneraria.



1115

Astragalus glycyphyllos.



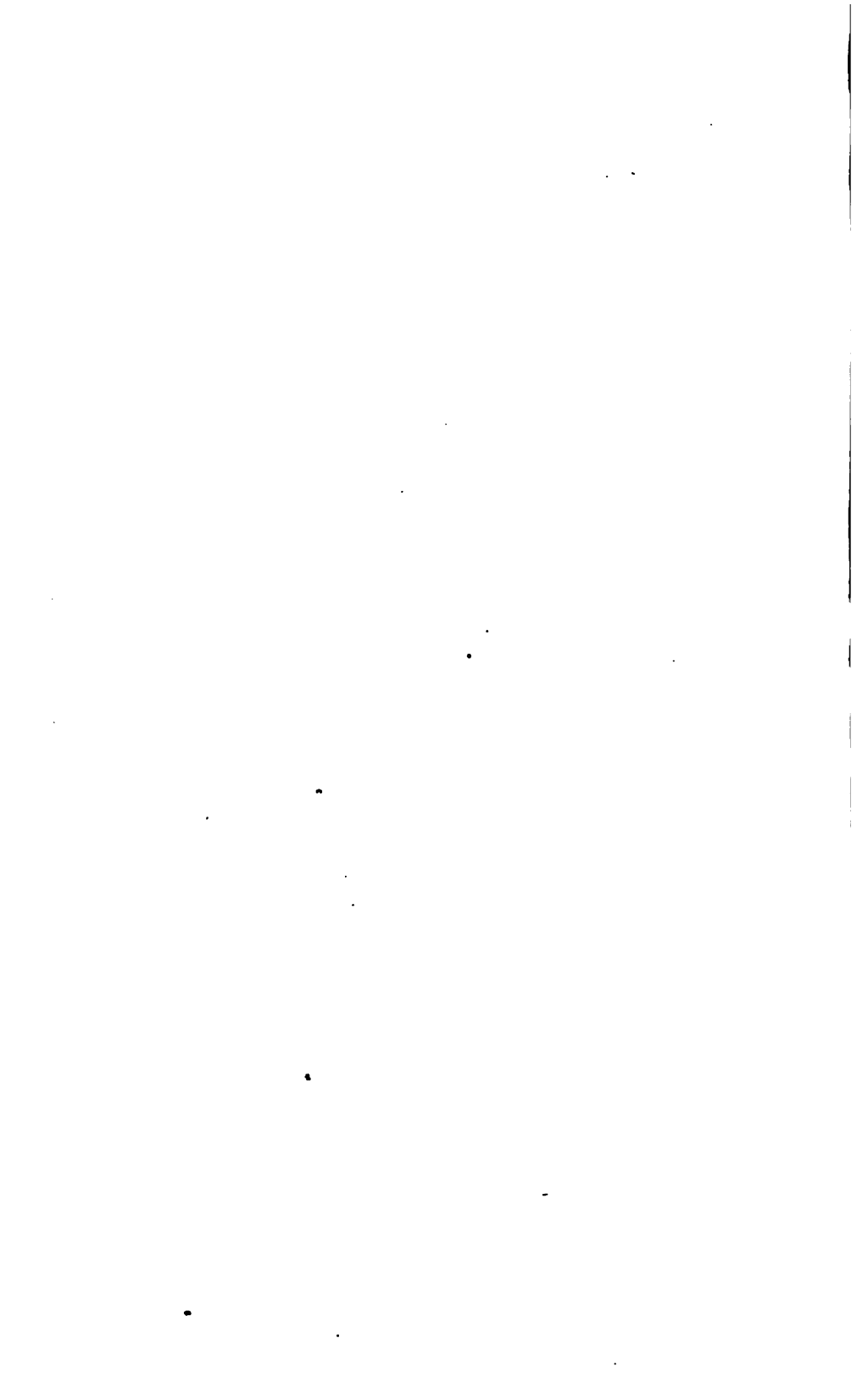
1116

Astragalus hypoglottis.



1117

Astragalus alpinus.



are gathered and pickled for the same use as capers. The wood is hard, and is an excellent material for veneering. Broom is often cultivated in gardens as an ornamental shrub, but it is in its native wilds that it boasts of its chief beauty. Burns says—

“ Their groves o’ sweet myrtle let foreign lands reckon,
Where bright beaming summers exalt the perfume ;
Far dearer to me yon lone glen o’ green breckan,
Wi’ the burn stealing under the lang yellow broom.

Far dearer to me are yon humble broom bowers,
Where the bluebell and gowan lurk lowly unseen ;
For there, lightly tripping among the sweet flowers,
A listening the linnet oft wanders my Jean.”

And Wordsworth, in allusion to the profusion of yellow flowers which it bears, says—

“ ’Twas that delightful season when the broom
Full flowered and visible on every steep,
Along the copses runs in veins of gold.”

GENUS VII. ONO'NIS.—LINN. *Rest-harrow*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* cut into five linear teeth. *Vexillum* large, striated. *Stamens* monodelphous. *Legumes* turgid, sessile, few seeded.—Named *ovos*, an *ass* ; because that animal delights to feed upon the plant.

1. *O. arvensis*, Linn. (Fig. 1118) *Common Rest Harrow*. Shrubby, hairy ; stem ascending ; branches at length spinous ; flowers axillary, solitary, nearly sessile ; leaves ovate oblong, toothed, the lower ones ternate, the upper simple ; stipules toothed ; legumes obliquely ovate, erect, shorter than the hairy calyx ; seeds two or three, rough.

English Botany, t. 682, and Suppl. t. 2659.—English Flora, vol. iii. p. 266.—Hooker, British Flora, ed. 4. vol. i. p. 268.—Lindley, Synopsis, Suppl. p. 322.—*O. antiquorum*, Linn.—*O. spinosa*, Linn. p. 78.—*O. procurrius*, Wallroth, p. 78.

Root long, tough wiry fibres. *Stems* annual, shrubby, of variable length, erect, reclining, or prostrate and rooting, round, branched, leafy, and mostly clothed with soft and more or less glandular pubescence, branches numerous, often terminating in a sharp rigid spine. *Leaves* ovate oblong, finely toothed, but often towards the base entire, the lower ones mostly ternate, the upper simple, sessile, or on short footstalks, mostly downy, especially on the under side, the mid-rib prominent, and the lateral veins straight, parallel. *Stipules* mostly large, united, clasping the stem, the margin finely toothed. *Inflorescence* solitary flowers in the axis of the upper leaves, more or

less numerous, forming an imperfect spike. *Flowers* sessile, or on a short footstalk, large, handsome, of a bright rose colour, striated with darker veins. *Calyx* persistent, of five linear teeth, much shorter than the corolla, enveloping and much longer than the legume, downy, and often glandulous. *Legume* obliquely ovate, or rhomboid, downy, bearing two or three seeds, rough, with small elevated tubercular points.

Habitat.—Barren pastures, heaths, borders of fields, and waste places.

Perennial; flowering from June to August.

Rest-harrow is an extremely uncertain plant in size; it varies from three or four inches to almost as many feet, and is either erect or becoming erect from a prostrate base, or it is altogether prostrate, and putting out roots occasionally from its joints, and is then creeping; and according to the dry or moist nature of the soil in which it grows it is simple, or its branches are furnished with terminal and often lateral spines; hence it has received different names, as *O. spinosa*, *O. repens*, and *O. arvensis*, of Linn., and the smaller, more rigid and spiny specimens are the *O. antiquorum* of the same author; but by removing a spiny plant growing in a dry soil to a moist and more favourable place of growth, it will soon lose its spines, and assume either the appearance of *O. repens* or *O. arvensis*. This adaptation of vegetables to circumstances is a remarkable and curious power in many tribes of plants natural to heaths, moors, and arid places; and for a few minutes let us arrest the attention of the student to a brief consideration of their physiological condition. In open and sterile parts of the country there are but few plants that will grow and flourish as well as under more favoured conditions, and these will require a protective means to secure their propagation under the unfavourable conditions of their growth: for few are enabled to produce more than a scanty number of seeds, and these, unless protected, would probably be destroyed by cattle. Nature, therefore, has provided such plants with defensive arms to guard them against such evils, and to protect their progeny from being cut off by untimely means. The means by which the abundant increase of the species by seed is prevented, (viz., the barrenness of the soil), is at the same time the power used by nature to protect the parent, and secure the developement of her smaller number of progeny: for the scanty supply of nutriment which the soil affords, renders the plant more rigid, and its buds, which under other and more favourable circumstances would be developed, become abortive, and are formed by starvation into spines, as an armour of defence; and according to the supply of food which it obtains, so is regulated the growth, developement, and produce of the plant. When much seed is produced, there is a great certainty of its propagating the species, and the plant then seems less careful to protect it; but when the seeds are

few, and the chances of their destruction becomes greater, then the parent plant expends its power in protecting and rearing them, and itself, as it would seem for the sake of its progeny, becomes rigid, deformed, and is, as it was characteristically called by Linnæus, *O. antiquorum*. In such a state it holds out but little temptation even to the most hungry of browsing cattle, to attempt to injure it in its unhappy looking condition.

2. *O. reclinata*, Linn. *Small Spreading Rest-harrow*. "Herbaceous, spreading, viscid, and hairy; leaves all stalked, ternate; stipules broadly ovate; peduncles single flowered; calyx about as long as the corolla, shorter than the closely reflexed cylindrical legumes, which have fourteen to sixteen warted seeds."

Hooker, British Flora, ed. 4. vol. i. p. 268.

Habitat.—"Steep bank close by the sea, two miles west from Tarbert, Galloway."—*Dr. Graham*, 1836.

Annual; flowering in July.

"This little species has been gathered in the above extremely wild locality, in considerable quantity, by Dr. Graham and his students. It is a South of Europe plant. The *O. Cherleri*, Linn. from Montpellier (*Thomas*), from Smyrna (*Unio Itiner*), and from Sicily (*Swainson*); and the *O. mollis*, of Tenore (*Herb Hook*), are not distinct from it."—*Hook*.

GENUS VIII. ANTHYLLIS.—LINN. *Kidney-vetch*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* tubular, five toothed, persistent, often inflated.

Petals nearly all of an equal length. *Legumes* ovate, turgid, one to three seeded, enclosed in the calyx.—Name from *ανθος*, a flower; and *ουλος*, a beard, or down; so called from the downy calyx.

1. *A. vulneraria*, Linn. (Fig. 1114.) *Common Kidney-vetch*, or *Lady's-finger*. Herbaceous leaves pinnate; leaflets unequal; heads of flowers in pairs; calyx with five ovate lanceolate teeth.

English Botany, t. 104.—English Flora, vol. iii. p. 277.—Hooker, British Flora, ed. 4. vol. i. p. 268.—Lindley, Synopsis, p. 77.

Root woody, with long slender branches. *Stems* annual, herbaceous, ascending about a foot high, round, mostly simple, clothed with pubescence and leafy, especially below. *Leaves* pinnate, downy on the under side and margin, smooth, and a glaucous green above, the radical leaves with long footstalks, and bearing a large simple terminate ovate lanceolate leaflet, rarely any lateral ones, these soon fall away, the rest with the terminal leaflet smaller, and bearing several pairs of opposite ones along the footstalk. *Inflorescence*

terminal heads of numerous crowded flowers, in a globose form, the heads mostly in pairs. *Bractææ* leafy, cut in a digitate manner. *Calyx* persistent, downy, pale, thin, membranous, inflated, the teeth five, ovate lanceolate, mostly a deep purplish colour. *Corolla* longer than the calyx, of five petals, all with linear claws, keel narrow, slightly cohering at the tips, wings obliquely ovate, standard with reflexed margins. *Legume* small, compressed, semi-orbicular, turgid, single seeded.

Habitat.—Dry pastures and road sides; frequent.

Perennial; flowering from June to August.

Varieties having the flowers crimson, pink, white, or cream coloured, are occasionally found; but they are not otherwise distinguished from the common state of the plant. The natural habit of this plant would seem to point it out as one of considerable value in dry stony or gravelly soils, where it flourishes well and affords good pasturage for sheep and cattle. It forms no inconsiderable part of the dry alpine pastures of Switzerland and the Pyrenees. Sheep and cattle are fond of it, and it is said to produce a large quantity of milk in these animals. By the old authors this plant seems to have been used as a vulnerary, hence its name; and it is probable that the soft downy leaves bound upon cuts and bruises would, by restraining the flow of blood, greatly assist the powers of nature in her healing processes. It has not now, however, so great a reputation as it formerly had. The *A. tetraphylla*, found in Italy and other parts of the South of Europe, is a very pretty little plant, and the beautiful white silvery looking species, the *A. Barba-jovis*, found in the same districts, is well worthy its place in the flower border.

GENUS IX. ASTRAG'ALUS.—LINN. *Milk-vetch*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* five toothed. *Corolla* with an obtuse keel. *Stamens* diadelphous. *Legume* more or less perfectly two celled, formed by the lower suture being turned inwards.—Named from *αστραγάλος*, one of the *bones of the foot*; but why the term is applied to this genus of plants does not appear.

1. *A. glycyphyllos*, Linn. (Fig. 1115.) *Sweet Milk-vetch*, *Wild Liquorice*. Stem prostrate, smooth; stipules ovate, acuminate; leaves longer than the peduncles; leaflets ovate; legumes obtusely triangular, linear, curved, smooth, erect, and crowded.

English Botany, t. 203.—English Flora, vol. iii. p. 294.—Hooker, British Flora, ed. 4. vol. i. p. 272.—Lindley, Synopsis, p. 78.

Root long deep fibres. *Stems* several, slender, from two to three feet long, angular, nearly smooth, branched, prostrate, leafy. *Leaves* alternate, the common footstalk long, tapering, channeled, leaflets in

from five to seven pairs, and an odd one ovate, smooth, a bright green. *Stipules* ovate lanceolate, acutely pointed, entire. *Inflorescence* axillary clusters, on peduncles, much shorter than the leaves. *Flowers* crowded, sessile, pale yellow. *Bracteas* linear, lanceolate. *Calyx* short, the teeth unequal. *Corolla* close, narrow. *Legumes* crowded, erect, about an inch long, smooth, curved inwards, obtusely three angled, the inner edge acute, the two outer ones obtuse, with the suture deeply pressed in between them. *Seeds* about eight, yellowish, attached to the inner suture.

Habitat.—Woods, thickets, hill sides, and the borders of fields, especially in a gravelly soil.

Perennial; flowering in June and July.

This is a long straggling plant with flowers, neither distinguished for beauty of colour, or form; the herbage has, when masticated, a sweetish taste, which shortly changes to that of a nauseous bitter, on which account it is refused by cattle: it is a troublesome weed in hilly pastures.

2. *A. hypoglottis*, Linn. (Fig. 1116.) *Purple Mountain Milk-vetch*. Stem spreading, hairy; stipules ovate; leaves shorter than the peduncles; leaflets small, ovate, slightly emarginate; legumes erect, capitate, roundish, ovate, acuminate, hairy, single seeded.

English Botany, t. 274.—English Flora, vol. iii. p. 294.—Hooker, British Flora, ed. 4. vol. i. p. 272.—Lindley, Synopsis, p. 78.

Root of slender spreading woody fibres. *Stems* several, spreading, prostrate at the base, curved upwards, branched, angular, somewhat furrowed, and more or less clothed with erect hairs. *Leaves* alternate, the common stalk slender, furrowed, from one to two inches long, leaflets from six to twelve pairs, small, ovate, obtuse, slightly emarginate, dark green, and scattered over with coarse hairs. *Stipules* ovate, hairy. *Inflorescence* crowded heads of numerous flowers, on axillary or terminal peduncles, longer than the leaves, angular, striated, and hairy. *Bracteas* linear, lanceolate. *Calyx* oblique, with five linear obtuse unequal teeth, clothed with black hairs. *Corolla* large, for the size of the plant, blue and purple, often variegated, and sometimes white. *Legumes* small, ovate, acuminate, curved, triangular, the outer suture pressed inwards, so as to form a furrow, dark brown, clothed with white hairs, and bearing a solitary seed.

Habitat.—Dry hilly, chalky, or gravelly pastures, especially in the eastern parts of England and Scotland.

Perennial; flowering in June and July.

The clusters of flowers are very large for the size of the plant, and in the more elevated situations they are a fine dark purple colour, very beautiful. It is frequent in the sub-alpine pastures of the Con

tinent, and in the more elevated alpine situations its ally, the *Oxytropis wralensis*, is found.

3. *A. alpinus*, Linn. (Fig. 1117.) *Alpine Milk-vetch*. Stem procumbent, and as well as the numerous pairs of ovate elliptic leaflets, pubescent; stipules ovate, free; flowers sub-capitate; wings shorter than the keel; legumes oblong, pendulous, clothed with black hairs.

English Botany, Suppl. t. 2717.—Hooker, British Flora, ed. 4, vol. i. p. 272.—Lindley, Synopsis, Suppl. p. 322.—*Phaca astragalina*, De Cand.

Root woody, slender, branched, and creeping. *Stems* several, slender, much branched, spreading, smooth below, above clothed with close pressed pubescence. *Leaves* alternate, pubescent, the *petioles* from three to four inches long, slender, channeled, *leaflets* ovate, or ovate elliptic, obtuse, sometimes notched at the end, pubescent, especially on the under side, from ten to twelve pairs, and a terminal odd one. *Stipules* ovate, sub-acute, free from the petiole, but occasionally united at the base, veined, smooth on the inner side, pubescent on the out. *Inflorescence* sub-capitate, of about twelve flowers, upon axillary peduncles, shorter than the leaves when in flower, but elongated when bearing the fruit, stout, angular, pubescent. *Calyx* campanulate, obliquely and unequally five toothed. *Corolla* white, tipped with lilac, the vexillum notched, reflexed, the wings linear, spatulate, shorter than the notched keel. *Fruit* pendulous, legumes oblong, inflated, flattened, and somewhat channeled along the lower suture, clothed with black hairs, and seldom bearing more than two perfect seeds.

Habitat.—Head of the Glen of the Dole, Clova, Scotland.—*Mr. Brand, Dr. Greville, and Dr. Graham.*

Perennial; flowering in July.

The discovery of this pretty little mountain plant as a native of our isles is one of great interest, from the circumstance of its being found also on the mountains of Siberia, Switzerland, and the Pyrenees. It is found also on the Rocky Mountains in North America, in Lapland, and was even brought by Captain Parry from Melville Island.

GENUS X. OXYTROPIS.—DE CAND. *Oxytropis*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* five toothed. *Corolla* with a pointed keel. *Stamen* diadelphous. *Legumes* more or less perfectly two celled, formed by the upper suture being turned inwards.—Name from *ὄξυς*, sharp; and *τροπή*, a keel; from the pointed keel of the corolla being one of the essential generic characters.





1118

Oxytropis uralensis.



1119

Oxytropis campestris.



1120

Melilotus officinalis.



1121

Melilotus leucantha.



1122

Trifolium pratense.



1123

Trifolium medium.

1. *O. Uralensis*, *De Cand.* (Fig. 1118.) *Hairy Mountain Oxytropis*. Stemless, silky; leaves with numerous pairs of oblong lanceolate leaflets; scape longer than the leaves, hairy, as well as the calyx; flowers in an ovate head; bracteas lanceolate, as long as the calyx; legumes erect, ovate, acuminate, cylindrical, inflated, pubescent, two celled.

Hooker, *British Flora*, ed. 4. vol. i. p. 178.—Lindley, *Synopsis*, p. 79.—*Astragalus uralensis*.—English Botany, t. 466.—English Flora, vol. iii. p. 295.

Root somewhat woody. The whole plant, and especially the young leaves, clothed with soft shining pubescence. *Stem* wanting. *Leaves* all radical, the petiole from three to five inches long, channeled, and bearing at its base a pair of oblong lanceolate *stipules*, veiny and membranous, *leaflets* in numerous pairs, oblong, lanceolate. *Scape* rather longer than the leaves, somewhat angular and hairy, bearing a terminal sub-racemose ovate head, of bright purple flowers. *Calyx* tubular, clothed with black and white hairs, the teeth linear, obtuse, the *bractea* lanceolate, membranous, hairy, about as long as the calyx, its mid-rib prominent. *Corolla* with the keel elongated into a point, shorter than the obliquely obtuse wings and notched spreading vexillum. *Legume* cylindrical, ovate, inflated, acutely pointed, and terminated with the persistent style, clothed with pubescence, two celled.

Habitat.—Dry mountain pastures in Scotland; Queen's Ferry, Montrose, Mull of Galloway; frequent on the coast of Sutherland.

Perennial: flowering in June and July.

The beautiful bright purple heads of flowers render this a valuable plant in ornamental rock work; but it requires a dry sandy exposed situation to produce them; for if grown in a moist one its colours are far less brilliant.

2. *O. campestris*, *De Cand.* (Fig. 1119.) *Yellow Mountain Oxytropis*. Stemless, leaves with numerous pairs of lanceolate leaflets; scape about as long as the leaves, and as well as the calyx clothed with erect hairs; flowers erect, in an ovate head; bracteas lanceolate, shorter than the calyx; legume erect, ovate, inflated, pubescent, half two celled.

Hooker, *British Flora*, ed. 4. vol. i. p. 273.—Lindley, *Synopsis*, p. 79.—*Astragalus campestris*.—English Botany, t. 2522.—English Flora, vol. iii. p. 296.

Root somewhat woody. The whole plant sparingly scattered over with silky hairs. *Stem* wanting. *Leaves* all radical, the petiole about six inches long, channeled and hairy, and bearing a pair of ovate lanceolate membranous hairy *stipules* at the base, *leaflets* in numerous pairs of narrow lanceolate leaflets, sparingly hairy, often smooth. *Scape* about as long as the leaves, somewhat angular and hairy,

bearing a terminal sub-racemose head of numerous pale yellow flowers. *Calyx* tubular, scattered over with black and white hairs, the teeth linear, obtuse, the *bracteas* lanceolate, shorter than the calyx. *Legumes* ovate, acute, erect, with a sharp point, scattered over with short black hairs, and only half divided into two cells.

Habitat.—Rock with a southern exposure, a little to the north of Bradooney, in the Clove Mountains.

Perennial; flowering in July.*

GENUS XI. MELILO'TUS.—TOURN. *Melilot*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* five toothed. *Keel* simple, *wings* shorter than the *vexillum*. *Stamens* diadelphous. *Legumes* oblong, or sub-globose, coriaceous, one or few seeded, indehiscent.—Name from *Mel*, honey, and *Lotus*, the genus.

1. *M. officinalis*, Lam. (Fig. 1120.) *Common Yellow Melilot*. Raceme lax, becoming elongated; petals nearly equal in length; legumes ovate, acuminate, rough, with netted veins, the upper suture compressed and downy; leaves acutely serrated, the apex notched; stem erect.

Hooker, British Flora, ed. 4. vol. i. p. 274.—Lindley, Synopsis, p. 79.—*Trifolium officinalis*, Linn.—English Botany, t. 1340.—English Flora, vol. iii. p. 297.

Root woody, tapering. *Stem* erect, from two to three feet high, angular, striated, smooth, branched, and leafy. *Leaves* ternate, smooth, dark green, petiole slender, the two lateral leaflets nearly sessile, the middle one with a longer footstalk, *leaflets* of the lower

* GENUS CORONIL'LA.—LINN. *Coronilla*.

GEN. CHAR. *Calyx* short, campanulate, sub-bilabiate, five toothed, the two upper teeth half united. *Corolla* with the keel acuminate into a point. *Stamens* diadelphous. *Legumes* elongated, straight, or curved, cylindrical, or angular.

1. *C. varia*, Linn. *Variable Coronilla*. Herbaceous, procumbent; stipules lanceolate, free; leaves with about ten pair of oblong obtuse leaflets; peduncles striated, longer than the leaves; flowers about twenty, umbellate; pedicels about three times longer than the calyx.

Habitat.—Fields and dry pastures, Bury-head, Devonshire, Dr. Bromfield; and at Linton, by the Rev. Mr. Levett, "in situations apparently wild."

Perennial; flowering in June and July.

We have introduced the characters of this species as a note, fearing that it may have only escaped into the above situations from gardens. It is a species very common in various parts of the Continent, and is frequently cultivated as a garden flower.

leaves obovate, the upper oblong, linear, all acutely serrated, and more or less distinctly notched at the apex. *Stipules* awl-shaped, entire. *Inflorescence* axillary racemes of numerous flowers, of a fine yellow colour, at first crowded, and drooping to one side, becoming much elongated, and more distant. *Bractees* awl-shaped, *petioles* slender, about as long as the nearly equally toothed calyx. *Corolla* with the petals all of nearly equal length. *Legume* pendulous, ovate, tapering at each end, roughish, with netted veins, the upper suture, compressed, and downy.

Habitat.—Bushy places and waste ground by road sides; not unfrequent.

Annual; flowering in June and July.

Melilot was formerly used in medicine as an external application in the form of fomentations, poultices, &c., and the reputation which it then obtained seemed to be owing rather to the odour given out in its drying, rather than from any power which it had in relieving disease; it is now quite out of use. It does not seem ever to have obtained in England any reputation as an agricultural plant, although in Italy it appears to have been used as a favourite food for horses. The Gruyere cheese has that peculiar flavour for which it is remarkable given to it by bruising this plant and mixing it with the curd. From the investigations of M. Guibourt and others, it has been ascertained that the odour of the plant depends upon the presence of a neutral substance, to which has been given the name of *Caumarin*, so called from the same substance having been found in the Tonquin bean, the fruit of the *Caumarouna oderata*. The identity of principle in these two plants was pre-supposed, from the similarity of their odours; according to M. Henry it is a compound of ten atoms of carbon, three hydrogen, and two oxygen. The flowers are much resorted to by bees, hence its name of Mel-honey lotus. Virgil, in his fourth Georgic, in giving directions relative to the habit of bees, says—

“ But when thou seest a swarming cloud arise,
That sweep aloft, and darken all the skies,
The motions of their hasty flight attend;
And know, to floods or woods their airy march they bend.
Then *melfoil* beat, and honey-suckles pound;
With these alluring savours strew the ground;
And mix with tinkling brass the cymbol's droning sound.”

Melilot is one of the plants of which the ancients used to make garlands to crown their distinguished victors on festive occasions, for which reason it was called '*Ghirlanda*, or garland flower. It is one of the common gay plants growing in all parts of Italy, and no one is more fitted for making wreaths, on account of its long slender pliant branches and numerous racemes of graceful flowers, and the odour which it exhales, as it dries, well fits it for such a use.

2. *M. leucantha*, Koch. (Fig. 1121.) *White Melilot*. Raceme lax, becoming elongated, the keel and wings elongated, the keel and wings nearly equal, but shorter than the vexillum; legumes ovate, obtuse, bristle pointed, rough, with netted veins, the upper suture, obtuse, smooth; leaves obtuse, acutely serrated; stem erect.

English Botany, Suppl. t. 2689.—British Flora, ed. 4. vol. i. p. 274.—Lindley, Synopsis, Suppl. p. 322.—*M. vulgaris*, Willd.—*Trifolium officinalis*, β. Linn.

Root somewhat woody, tapering. *Stem* erect, from one to about two feet high, angular, furrowed, smooth, branched, and leafy. *Leaves* upon short stalks, ternate, *leaflets* of the lower ones ovate, the upper oblong, narrow, unequally but sharply toothed, the lateral ones numerous, parallel, *Stipules* small, slender, awl-shaped. *Inflorescence* axillary racemes, with long stalks, often paniculated at the tops of the stem. *Flowers* numerous, white. *Pedicle* slender, about as long as the calyx, slightly hairy, with a slender bristle-shaped *bractea* at its base. *Calyx* five ribbed, with nearly equal teeth. *Corolla* having the wings as long as the keel, but shorter than the reflexed vexillum. *Legume* drooping, ovate, pointed with the style, netted with elevated lines, smooth, two seeded, scarcely longer than the calyx teeth.

Habitat.—Fields and pastures in various parts of England; near Edinburgh, and St. David's, Fife, Scotland.

Biennial; flowering in July and August.

GENUS XII. TRIFOLIUM.—LINN. *Trefoil*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* tubular, persistent, five cleft or five toothed. *Corolla* persistent. *Keel* obtuse, shorter than both the vexillum and wings. *Stamens* diadelphous. *Legumes* ovate, indurulent, one or two seeded, rarely oblong, and three or four seeded.—So named in allusion to the ternate leaves.

1. *LAGOPUS*, Koch. *Flowers sessile, collected into a roundish or oblong head. Calyx with its mouth surrounded with a callous line often hairy.*

1. *T. pratense*, Linn. (Fig. 1122.) *Common Purple or Meadow Trefoil*. Heads ovate, often two together, nearly sessile in the axis of the involucre; calyx ten ribbed, pubescent, erect in fruit, the teeth bristle-shaped, the lower one largest; leaflets ovate, entire; stipules ovate, bristle pointed, smooth; stem ascending.

English Botany, t. 1770.—English Flora, vol. iii. p. 302.—Hooker, British Flora, ed. 4. vol. i. p. 275.—Lindley, Synopsis, p. 80.

Root fibrous, mostly much branched at the crown. *Stems* ascending, round, or slightly angular, nearly smooth below, hairy above,

about a foot high. scarcely branched. *Leaves* alternate, distant, the lower ones on long slender footstalks, the upper ones on shorter, leaflets on short partial footstalks, ovate, or elliptic, entire, or slightly toothed, often notched at the apex, and the mid-rib terminating in a point, paler beneath, with a prominent mid rib, and numerous fine parallel lateral veins, nearly smooth, or downy, the upper side mostly marked with a pale crescent-like spot. *Stipules* pale, membranous, ovate, acute, bristle pointed, reticulated with coloured veins. *Inflorescence* terminal, solitary, round, or ovate heads, sometimes in pairs, nearly sessile in the axis of the *involucre*. *Calyx* cylindrical, ten ribbed, somewhat pubescent, the mouth surrounded with a ring of pale hairs, and five bristle-shaped teeth, the lower one longest, erect in fruit. *Corolla* dark purple, pink, and sometimes white. *Petals* all united into a tube. *Legume* inclosed in the calyx small, roundish, single seeded.

Habitat.—Meadows and pastures; frequent.

Perennial; flowering during the summer months.

This species of Clover is the most valued of all the *artificial grasses* for agricultural purposes, whether for cutting, while green, or for making into hay, its produce being greater, and is more relished by cattle than any of the other species; and from experiments made upon it by Mr. Sinclair and others, it appears to contain a greater proportion of nutritious matter. It, like all the other species, flourishes best in a dry light soil, in which the long ramifications of its roots can penetrate; in such situations in a dry season it produces the greatest quantity of seed, and if the season is a wet one, the bulk of produce is greater; but whether under such circumstances it contains in proportion a greater quantity of nutriment, is a questionable matter. It is often sown with rye grass when it is intended to be cut for hay; and in many cases this mixture of grass and clover seems to answer to the grower better than when grown alone, especially if the soil is not very porous.

2. *T. medium*, Linn. (Fig. 1128.) *Zigzag Trefoil*. Heads globose, solitary, pedunculated; calyx ten ribbed, smooth, erect in fruit, with the teeth bristle-shaped, ciliated, the lower one longest; leaflets elliptic, finely toothed; stipules lanceolate, taper pointed; stem ascending, zigzag, branched.

English Botany, t. 190.—English Flora, vol. iii p. 302.—Hooker, British Flora, ed. 4. vol. i. p. 275.—Lindley, Synopsis, p. 80.

Root somewhat creeping. *Stem* ascending, mostly much branched, and bent at each joint, round, smooth, or clothed with soft pubescence. *Leaves* petiolated, the leaflets sessile, elliptic, acute, or obtuse, sometimes notched at the apex, the margin fine toothed, dark green above, somewhat glaucous, and generally hairy beneath, the mid-rib prominent, the lateral veins minute, numerous. *Stipules* lanceolate, with a long linear point, ribbed, with coloured veins, and downy.

Inflorescence a terminal globose head of numerous rather loose flowers, elevated on a short or long peduncle. *Calyx* cylindrical, ten ribbed, smooth, the teeth bristle-shaped, and hairy, the lower tooth much longer than the others, the mouth hairy. *Corolla* a pale purple. *Seeds* irregularly heart-shaped, the radical very prominent.

Habitat.—Pastures and meadows; frequent.

Perennial; flowering in July.

The different habit of this species renders it a preferable plant for heavy soils, and its spreading roots enable it to resist long seasons of drought; hence it is that it flourishes better in a tenacious soil, and is better suited for permanent pastures than the *T. pratense*. From the experiments, however, which have been made with it, and comparing the quantity of nutritious matter which it affords with that of *T. pratense*, it seems in all cases to be only about one half; so that however useful it may be in the circumstance above mentioned, it is not the species that the farmer would select for a hay crop. It varies according to the situation of its growth as to size and hairiness, and the heads are elevated upon a short or long pedicle, but in other respects it is constant in its characters.

3. *T. ochroleucum*, Linn. (Fig. 1124.) *Sulphur-coloured Trefoil*. Heads terminal, solitary, pedunculated; calyx ten ribbed, pubescent, the mouth closed with a ring, erect teeth, awl-shaped, the lower one longest, at length reflexed; leaves distant; leaflets elliptic, or obovate, entire, or notched at the apex, downy, the lower ones heart-shaped; stipules lanceolate, awl-shaped; stem ascending.

English Botany, t. 1224.—English Flora, vol. iii. p. 301.—Hooker, British Flora, ed. 4. vol. i. p. 275.—Lindley, Synopsis, p. 80.

Root tapering. *Stems* mostly several, ascending, from twelve to eighteen inches high, round, more or less branched, and clothed with short erect tawny hairs. *Leaves* distant, the lower ones alternate, with long footstalks and leaflets, ovate, or heart-shaped, the upper pair of leaves opposite, and the leaflets narrow, oblong, lanceolate. *Stipules* lanceolate, with a taper point, pale, membranous, striated, with coloured ribs, downy. *Inflorescence* a terminal globose head of dense pale sulphur coloured flowers, elevated on a hairy pedicle, of greater or less length. *Calyx* cylindrical, ten ribbed, and furrowed, downy, the teeth five, unequal, the lower one much the longest, and reflexed in seeds, the margins ciliated. *Legume* small, membranous. *Seeds* solitary, yellow.

Habitat.—Pastures and road sides, especially in a light gravelly soil; not unfrequent.

Perennial; flowering in July and August.

This as an agricultural plant seems very inferior to the above species, and is not cultivated alone, or intentionally to any considerable extent with any other. The heads of the flowers are at first



1194 *Trifolium ochroleucum.*



1195 *Trifolium maritimum.*



1196 *Trifolium stellatum.*



1127 *Trifolium arvense.*



1128 *Trifolium scabrum.*



1129 *Trifolium striatum.*

globose, but become oblong, and the corolla is persistent, drying a brownish colour. It is not unfrequent in the mountain woods and pastures of the Continent.

4. *T. maritimum*, Huds. (Fig. 1125.) *Teasel-headed Trefoil*. Heads terminal, sub-globose, sub-sessile; calyx campanulate, ten ribbed, its teeth broad acuminate, rigid, ciliated, unequal, the lower one largest, three ribbed, the others single ribbed, all at length spreading; leaflets oblong, obovate, obtuse, or notched, sub-dentate; stipules long, narrow, awl-shaped; stem ascending.

English Botany, t. 220.—English Flora, vol. iii. p. 303.—Hooker, British Flora, ed. 4. vol. i. p. 275.—Lindley, Synopsis, p. 80.

Root tapering. *Stem* ascending, or erect, round, striated, nearly smooth, branched and leafy. *Leaves* alternate below, on long slender footstalks, and the leaflets oblong, obtuse, or notched, the upper pair opposite, narrow, linear, acutely pointed, all single ribbed, with slender lateral veins, dark green, paler beneath, and downy, the margins towards the apex somewhat toothed. *Stipules* long, narrow, linear, pale, membranous, with dark veins. *Inflorescence* terminal and sometimes axillary globose heads of crowded flowers, sessile, or nearly so in the axis of the upper pair of leaves. *Calyx* sub-campanulate, smooth, or somewhat downy, distinctly ten ribbed at the base, the teeth rigid, broadly acuminate, the lower one much the largest, three ribbed, the rest single ribbed, all ciliated on the margin, and spreading, the mouth closed with a hardened ring. *Legume* membranous, single seeded. *Seed* roundish, with a prominent radicle.

Habitat.—Saline marshy places near the sea, on the east and south coast of England; Newport, Monmouthshire; and near Kilbarick Church, Ireland.

Annual; flowering in June and July.

This is readily distinguished from all the other of our species, by its rigid looking heads and remarkable calyx enlarging and dilating its teeth after flowering. It is not a very common plant with us, but we have found it frequent in various parts of the maritime pastures of Italy; and about Pisa it is commonly cultivated in the low damp meadows, where it seems to flourish extremely well, and to produce an abundant crop, which is cut green, as well as made into hay. It is probable that it might be cultivated with advantage in low damp meadows with us, especially in the southern districts of England and Ireland.

5. *T. stellatum*, Linn. (Fig. 1126.) *Starry-headed Trefoil*. Heads terminal, sub-globose, pedunculated, hairy; calyx ten ribbed, its mouth closed with hairs, its teeth longer than the corolla, becoming dilated at the base and veiny; leaves obcordate, toothed towards the apex; stipules broadly ovate, membranous, veiny, toothed on the margin, downy, as well as the ascending stem.

English Botany, t. 1645.—English Flora, vol. iii. p. 304.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 80.

Root slender, tapering. *Stems* several, from six to ten inches long, round, branched, ascending, clothed as is the rest of the plant with soft pubescence. *Leaves* alternate, on short stalks, leaflets obcordate, unequally toothed, the mid-rib stout, and the lateral veins prominent. *Stipules* large, broadly ovate, pale, thin, and membranous, veiny, toothed on the margin, and hairy. *Inflorescence* a globose head of crowded flowers, elevated on a peduncle. *Calyx* very downy, ten ribbed, its teeth when in flower bristle-shaped, erect, longer than the corolla, in fruit much enlarged and dilated at the base, becoming veiny, and spreading in a star-like manner, its mouth closed with a tuft of hairs. *Corolla* small, pink, concealed by the calyx teeth. *Legume* inclosed in the calyx, containing a single pale ovate seed.

Habitat.—Sea shore, Sussex, between Shoreham harbour and the sea, abundant.

Annual; flowering in July and August.

This curious species of Clover, it is supposed, has been introduced and become naturalized. It is frequent in Italy, but is by no means confined to the sea shore, but is, perhaps, more common in mountainous districts than near the sea. It does not appear to possess any agricultural merits.

6. *T. arven'se*, Linn. (Fig. 1127.) *Hare's-foot Trefoil*. Heads solitary, terminal, nearly cylindrical, very downy, pedunculated; calyx ten ribbed, its teeth bristle-shaped; stipules ovate, acuminate; leaves linear, oblong; stem erect, much branched, downy.

English Botany, t. 944.—English Flora, vol. iii. p. 305.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 80.

Root slender, tapering, and branched. *Stem* erect, about a foot high, alternately branched and spreading, round, clothed with soft pubescence. *Leaves* on short footstalks, leaflets linear, oblong, the mid-rib stout, prominent, the margin obsoletely toothed, clothed with close pubescence. *Stipules* ovate lanceolate, or acuminate, membranous, downy, ribbed. *Inflorescence* terminal cylindrical heads of numerous crowded flowers, elevated on a slender peduncle. *Calyx* sub-cylindrical, ten ribbed, very downy, its teeth bristle-shaped, erect in flower, spreading in fruit. *Corolla* small, pink, inconspicuous. *Legume* inclosed within the calyx, single seeded.

Habitat.—Corn fields, dry pastures, and waste places; common.

Annual; flowering in July and August.

This common species is a pretty ornamental plant, producing an abundance of its pink soft downy heads. It does not appear to be a plant selected as food by any class of animals, nor is it applied to any other use than as an ornamental plant for adorning chimney pieces

during the winter, for which purpose it is well suited, as it retains its elegant form and appearance after being dried, and when mixed with some of the more elegant forms of grasses, forms a permanent and beautiful decoration, until the fresh flowers of spring appear.

7. *T. soa'brum*, Linn. (Fig. 1128.) *Rough Rigid Trefoil*. Heads ovate, lateral and terminal, with an involucre at the base; calyx rigid, downy, ten ribbed, its teeth unequal, lanceolate, rigid, single ribbed, at length recurved, its mouth closed; leaves oblong, wedge-shaped, toothed, the veins on the margin arched and prominent; stipules ovate, acute; stem procumbent.

English Botany, t. 903.—English Flora, vol. iii. p. 306.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 80.

Root tapering. *Stems* several, from three to nine inches long, procumbent, branched at the base, and spreading, round, or somewhat angular, rigid, hairy. *Leaves* petiolated, downy, leaflets oblong, wedge-shaped, with a prominent mid-rib and lateral veins, arched near the margin, unequally toothed. *Stipules* membranous, ovate, acute, ribbed and downy. *Inflorescence* ovate heads of crowded flowers, terminal, and in the axis of the upper leaves the base enveloped in an involucre. *Calyx* cylindrical, in fruit downy, ten ribbed, and furrowed, the teeth unequal, rigid, lanceolate, acute, erect in flower, spreading, and recurved in fruit. *Corolla* small, inconspicuous. *Legume* membranous, single seeded.

Habitat.—Dry chalky or sandy fields in various parts of England; Anglesea, near Edinburgh, and Dunbar, Scotland; near Sandymount, and at Kilbarrick Church, Ireland.

Annual; flowering in May and June.

8. *T. stria'tum*, Linn. (Fig. 1129.) *Soft Knotted Trefoil*. Heads ovate, becoming cylindrical, terminal and lateral, with an involucre at the base; calyx hairy, its tube ten ribbed, becoming tumid, the teeth unequal, lanceolate, bristle-shaped, the mouth closed with a cartilaginous ring; leaves oblong, wedge-shaped, serrated, the veins equal and straight at the margin; stipules ovate, acute; stems ascending.

English Botany, t. 1843.—English Flora, vol. iii. p. 307.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 80.

Root slender, tapering. *Stems* numerous, procumbent, of various lengths, round, branched, downy. *Leaves* numerous, the lower on long footstalks, the upper on short ones, downy, leaflets obovate, finely toothed and downy, the mid-rib prominent, and the lateral ones straight, parallel, the leaflets of the lower leaves often heart-shaped. *Stipules* broadly ovate, pointed, membranous, striated, with coloured veins, downy. *Inflorescence* small ovate heads, becoming cylindrical, terminal and lateral, all with an involucre at the base. *Calyx* hairy, its tube cylindrical, ten ribbed, and deeply furrowed, becoming after flowering swollen and tumid, the teeth unequal, awl-shaped, rigid,

always erect, ciliated, the mouth closed with a cartilaginous ring. *Corolla* scarcely longer than the calyx, pale rose colour. *Legume* membranous, containing two seeds, but only perfecting one.

Habitat.—Dry fields and pastures; frequent.

Annual; flowering in June.

2. *TRIFOLIASTRUM*. De Cand. Prod. 2. p. 198. *Flowers in a rounded head, or spike, sessile, or pedunculated. Calyx mouth naked. Corolla after flowering persistent, the vexillum striated.*

9. *T. suffocatum*, Linn. (Fig. 1130.) *Suffocated Trefoil*. Heads sessile, sub-globose, axillary, of numerous sessile densely crowded smooth flowers; calyx membranous, its mouth naked, the teeth lanceolate, acute, unequal, spreading; leaflets obcordate, acutely serrated; stipules ovate, acute, membranous; stem prostrate; legume two seeded.

English Botany, t. 1049.—English Flora, vol. iii. p. 299.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 79.

Root slender, tapering. *Stems* prostrate, mostly several, round, smooth, leafy, mostly buried under the ground. *Leaves* on long slender footstalks, leaflets obcordate, smooth, acutely toothed towards the apex. *Stipules* large, ovate, acute, membranous, and striated. *Inflorescence* sessile globose axillary heads of numerous smooth crowded erect flowers, having an involucre enveloping the base. *Calyx* membranous, sub-cylindrical, slightly striated, and sometimes scattered over with a few slender hairs, the teeth unequal, lanceolate, acute, spreading, its mouth open. *Corolla* small, inconspicuous. *Legume* oblong, two seeded.

Habitat.—Sandy sea shores, rare; coasts of Norfolk, Suffolk, near Hastings, Anglesea.

Annual; flowering in June and July.

10. *T. glomeratum*, Linn. (Fig. 1131.) *Smooth round-headed Trefoil*. Smooth, heads globose, axillary, sessile, of numerous crowded sessile smooth flowers; calyx cylindrical, ten ribbed and furrowed, the teeth ovate, acute, becoming leafy, veiny, and reflexed; leaflets oblong, acutely toothed and veiny; stipules membranous, lanceolate, taper pointed; stem procumbent; legume two seeded.

English Botany, t. 1063.—English Flora, vol. iii. p. 307.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 81.

Root tapering, branched. *Stem* prostrate, smooth, round, or some what angular, more or less branched and leafy, from four to twelve inches long. *Leaves* with long slender footstalks, leaflets of the lower leaves obcordate, of the upper oblong, all smooth, with the mid-rib and lateral veins prominent, acutely toothed. *Stipules* pale, thin, and membranous, striated with veins, lanceolate, taper pointed. *Inflorescence* axillary globose heads of numerous smooth sessile flowers. *Calyx* cylindrical, ten ribbed, and furrowed, smooth, the



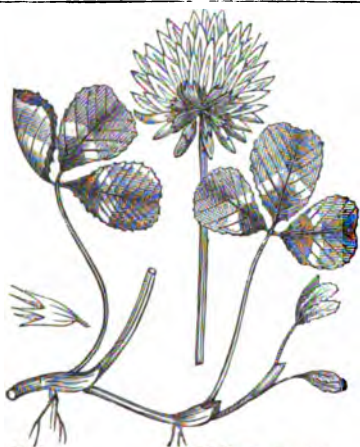
1130

Trifolium suffocatum.



1131

Trifolium glomeratum.



1132

Trifolium repens.



1133

Trifolium procumbens.



1134

Trifolium filiforme.



1135

Trifolium filiforme v. microphyllum.

teeth ovate, acute, becoming leafy and veiny, and reflexed. *Corolla* small, pink, the vexillum striated. *Legume* membranous, mostly two seeded.

Habitat.—Dry sandy pastures and waste places in the East and South of England.

Annual; flowering in June.

This species does not appear to have been found in elevated or cold situations. It is not unfrequent in the sandy pastures about Pisa or Rome, and is found in other parts of Italy, as well as in France.

11. *T. repens*, Linn. (Fig. 1132.) *White Trefoil, or Dutch Clover*. Heads globose, axillary, on long peduncles; pedicles after flowering, deflexed; calyx smooth, its mouth naked, its teeth lanceolate, the two upper ones longest; leaflets obovate, or sub-cordate, and toothed; stipules membranous, ovate, with a long point; stem creeping and rooting; legume three or four seeded.

English Botany, t. 1768.—English Flora, vol. iii. p. 299.—Hooker, British Flora, ed. 4. vol. i. p. 274.—Lindley's Synopsis, p. 81.

Stem long, creeping, and putting out fibrous roots from the joints, smooth, striated, solid, and branched. *Leaves* alternate, the footstalks long, slender, channeled, erect, *leaflets* three, equal, on short stalks, roundish ovate, or obcordate, the margin finely toothed, the mid-rib prominent, and the lateral ones fine, parallel, straight, smooth, sometimes reddish on the under side, the upper mostly with a pale transverse mark near the base, sometimes it is a dark purple or green. *Stipules* pale, thin, membranous, ovate, obtuse, with a linear point. *Inflorescence* axillary heads of numerous crowded sub-umbellate flowers, the common stalk long, smooth, striated, the partial ones slender, downy, about as long as the calyx, erect in flower, curved downwards in seed. *Calyx* smooth, tubular, its teeth linear, lanceolate, the two upper ones longest. *Corolla* white, persistent, becoming pale brown, and scarious. *Legume* three or four seeded.

Habitat.—Meadows and pastures; common.

Perennial; flowering through the summer months.

Curious varieties of this species are occasionally found in wet situations. Some have the partial footstalks much elongated, and the teeth of the calyx expanded into a leafy toothed segment; and it is not an unfrequent occurrence to find with these the legume enlarged and protruded beyond the calyx on a slender pedicle, and not unfrequently the legume is expanded; all are abortive in these varieties. The pedicles are all erect, and not recurved after flowering.

This is one of the most valuable species of artificial grasses, both for fodder and pasture lands, especially in a light sandy or chalky soil. It is enabled by its long solid creeping stems to bear long droughts of summer, and from its putting out roots from every joint, it is enabled to bear continued cropping without injury, and its being

trod down by cattle is a means of increase, rather than of destruction; for then each joint forms an independent plant, and puts out its numerous stems and branches. It is a remarkable circumstance in the history of this plant, that it seems to have the power of preserving its seeds for an indefinite time; if a patch of any part of the moors of Yorkshire or Derbyshire, or elsewhere, which is covered over with the usual ling, ferns, cowberry, bilberry, mosses, &c., is pared, the sods burned, and the ashes spread over the soil, in a short time this portion of land becomes covered over with a crop of white trefoil in a state of great luxuriance. As a valuable pasture plant this seems early to have been noticed. Virgil says, giving directions about sheep—

"If milk be thy design, with plenteous hand
Bring clover grass; and from the marshy land,
Salt herbage for the fodd'ring rack provide,
To fill their bags and swell the milky tide."

In former days the Shamrock, or Shamrog, the national badge of the Irish, appears to have been the leaves of the *Oxalis acetosella*, but in more modern times the leaves of the Clover have been its rival for this national honour. It was supposed formerly that Clover had a supernatural power, and that it was "noisome to witches," and in those times not only the peasants but the lords of the land wore the Clover leaf as a protection against such evil influence.

"Woe, woe to the wight who meets the green knight,
Except on his faulchion arm,
Spell proof he bear, like the brave St. Clair,
The holy trefoil's charm."

A remnant of the former superstitions is still found among the peasantry, by their seeking with diligence a four leaved Clover, and when found it is considered a most favourable omen.

12. *T. procumbens*, Linn. (Fig. 1133.) *Hop Trefoil*. Smooth, heads lateral, pedunculated, rounded, becoming oblong; flowers numerous, densely crowded, at length deflexed and furrowed; calyx smooth, its mouth naked; leaves stalked; leaflets obcordate, the lateral ones sessile, the middle one stalked; stipules half ovate.

β. majus Stem at first erect; heads large, a deep yellow; peduncles as long, or scarcely longer than the leaves.—*T. campestris*, Schred.—*T. agrarium*, Gmel.

β. minus. Stem mostly procumbent; heads smaller, a pale sulphur colour; peduncles often twice as long as the leaves.—*T. procumbens*, Schred.

English Botany, t. 945.—English Flora, vol. iii. p. 309.—Hooker, British Flora, ed. 4. vol. i. p. 277.—Lindley, Synopsis, p. 81.

Root slender, fibrous. *Stem* round, smooth, or slightly hairy, much branched, erect, and spreading, or procumbent, leafy, from six to twelve inches long. *Leaves* petiolated, leaflets ovate, or obcordate,

smooth, somewhat glaucous, veiny on the under side, toothed, the lateral ones sessile, the middle one elevated on a slender footstalk. *Stipules* half ovate, acute, entire, ribbed, and mostly hairy. *Inflorescence* dense crowded heads, becoming oblong, of about forty yellow flowers, arising from the axis of the leaves, and elevated on a peduncle, which is as long, and often much longer than the leaves. *Flowers* varying from a pale sulphur colour to an orange yellow, the *calyx* smooth, the two upper teeth smallest, the mouth naked. *Corolla* persistent, deflexed after flowering, and the vexillum becomes deeply striated, tawny, and membranous. *Legume* small, pointed, single seeded.

Habitat.—Dry pastures, borders of fields, and waste places; frequent.

Annual; flowering from June to July.

13. *T. filiforme*, Linn. (Fig. 1134.) *Lesser Yellow Trefoil*. Heads lateral, pedunculated, lax, about ten flowered, at length deflexed; calyx smooth, its mouth naked; leaves stalked; leaflets obovate, or obcordate, the lateral ones sessile, the middle one stalked; stipules half ovate.

β. major. Heads many flowered; peduncles much longer than the leaves.—*T. filiforme*, Sturm.—*T. procumbens*, Poll.—*T. minus*, Relh.—English Botany, t. 1256.—Lindley, Synopsis, p. 81.

γ. microphyllum, (Fig. 1135.) Smaller, leaves small, heads of few and distant flowers, peduncles frequently not exceeding the leaves.

T. controversum, Jan.—*T. lupulinum minimum*, Dill. in Raii Synop.—*T. filiforme*, Linn.—English Botany, t. 1257.—Hooker, British Flora, ed. 4. vol. i. p. 277.—Lindley, Synopsis, p. 81.

Root tapering, and fibrous. *Stems* mostly numerous, round, smooth or downy at the extremity, slender, prostrate, from four to twelve inches long, leafy, and more or less branched. *Leaves* petiolated, leaflets obovate, or obcordate, finely toothed, a somewhat glaucous green, paler beneath, finely ribbed, the lateral ones nearly sessile, the centre one elevated on a slender footstalk. *Stipules* ovate, acute, mostly fringed. *Inflorescence* small axillary heads of from three to ten flowers, elevated on a slender pedicle, downy, and longer than the leaves. *Calyx* smooth, its mouth naked, the teeth unequal, the two upper ones shortest, mostly fringed with fine hairs. *Corolla* small, pale or orange yellow, becoming dark brown and membranous, slightly furrowed. *Legumes* obovate, single, rarely two seeded.

Habitat.—Dry pastures and road sides; frequent.

Annual; flowering in June and July.

This, like the last species of Trefoil, is a favourite food of sheep and cattle; and as it flourishes best on dry sandy or gravelly soil, it is found one of the best and most useful artificial grasses, especially for those crops intended for making into hay, or for mowing green for

stall feeding. The numerous heads of beautiful bright yellow flowers which they produce, render it a very pretty gay looking plant, but more especially some of the larger flowered and deeper coloured species, which grow in great profusion on the Continent, as the *T. agrarium*, *T. spadicum*, &c. ,

3. *VESICASTRUM*. Ser. *Flowers in a rounded head. Calyx mouth naked, becoming inflated, membranous, and reticulated with coloured veins.*

14. *T. fragiferum*, Linn. (Fig. 1136.) *Strawberry headed Trefoil.* Heads globose, on long axillary peduncles; calyx after flowering inflated, membranous, reticulated and downy, the two upper teeth elongated and recurved; leaves obovate or obcordate; stipules narrow, linear; stem prostrate.

English Botany, t. 1050.—English Flora, vol. iii. p. 308.—Hooker, British Flora, ed. 4. vol. i. p. 277.—Lindley, Synopsis, p. 81.

Roots fibrous. *Stems* prostrate, long, spreading, branched, and taking root from the joints, leafy, round and smooth. *Leaves* with long footstalks, leaflets all sessile, or nearly so, ovate or obovate, or obcordate, finely toothed, a dark green, paler beneath, with a prominent mid-rib and numerous fine lateral veins. *Stipules* pale, membranous, linear lanceolate, with a slender elongated point. *Inflorescence* a globose head of numerous crowded pink flowers, elevated on a long smooth or slightly downy pedicle from the axis of the leaves, enveloped at the base in an *involucre*, cut into numerous narrow lanceolate segments. *Calyx* downy, tubular, two lipped, the upper side becoming after flowering much inflated, thin, membranous, and bladdery, reticulated with numerous coloured veins, from this part of the calyx enlarging, and the under side remaining the same, the two upper teeth are curved downwards, so that it forms a complete covering and protection from rain, &c. for the inclosed legume. *Corolla* small, pale rose colour, soon fading and withering away. *Legume* small, roundish, two seeded.

Habitat.—Moist meadows and pastures.

Perennial; flowering in July and August.

This appears to be of little or no agricultural value; but is a remarkable plant, from the change which the calyx undergoes after flowering. Its appearance is that of a strawberry, from which it has derived its name.

15. *T. resupina'tum*, Linn. (Fig. 1137.) *Reversed Trefoil.* Heads globose, on axillary peduncles; calyx after flowering membranous, inflated into a narrow tubular neck, netted with longitudinal and transverse veins, downy; leaflets obovate, acutely serrated; stipules linear lanceolate, short; stem prostrate.

English Botany, Suppl. t. 2789.—Hooker, British Flora, ed. 4. vol. i. p. 277.—Lindley, Synopsis, Suppl. p. 323.



1136

Trifolium fragiferum.



1137

Trifolium resupinatum.



1138

Trifolium subterraneum.



1139

Trigonella ornithopodioides.



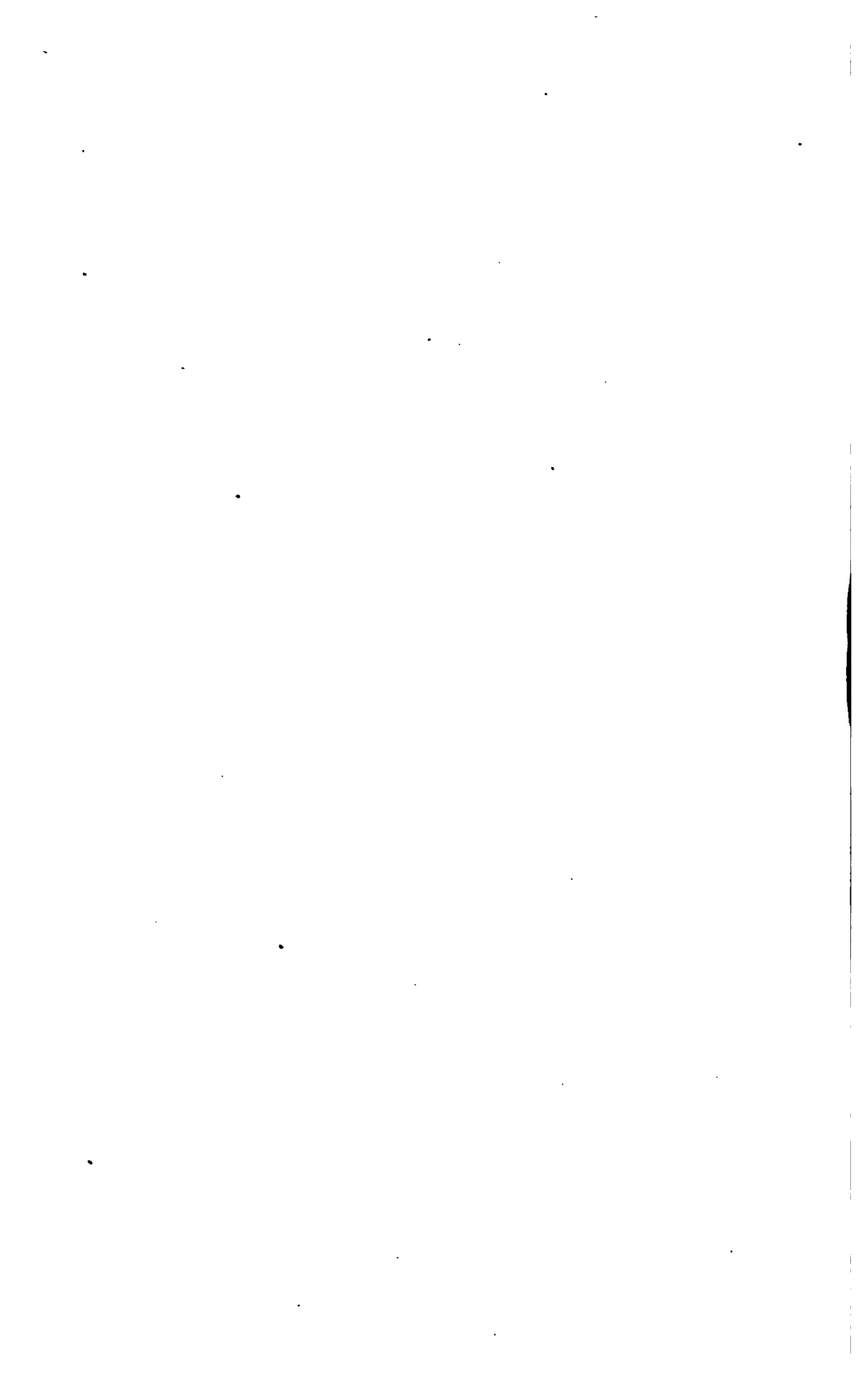
1140

Lotus corniculatus.



1141

Lotus corniculatus var. *tenifolius*



Root branched and fibrous. *Stems* several, prostrate, or ascending, round, smooth, branched, and spreading. *Leaves* numerous, dark green, paler beneath, often marked with a dark stain near the base, petioles of the lower leaves long, those of the upper short. *Leaflets* obovate, or oblong, acute, rarely notched, acutely toothed. *Stipules* narrow, short, linear lanceolate. *Inflorescence* hemispherical, at length globose heads of crowded flowers, elevated on a short peduncle, which becomes much elongated. *Calyx* small, imperfectly two lipped, the upper one hairy, becoming after flowering much enlarged, dilated, pale, thin, membranous, ovate, with a long narrow tubular neck, netted with straight longitudinal ribs and numerous slender transverse ones, terminated by two bristle-shaped spreading teeth, downy. *Corolla* elongated, pale pink, the vexillum placed opposite the lower three toothed lip, and becoming recurved. *Legume* small, mostly two seeded.

Habitat.—Meadows near Bristol, and near Poole.

Annual; flowering in July.

This species of the strawberry headed Clover, it is probable, has been introduced from the Continent, where it is not uncommon. In Italy it is frequently cultivated and grown for hay crops, or it is cut green and consumed in that state. It appears to flourish extremely well on a light sandy soil, and produces a very heavy crop, and in many places where the soil is light and moist, it promises to be a very valuable plant from its great produce, and may with advantage in many instances be substituted for *T. procumbens* or *T. filiforme*.

4. *TRICHOCEPHALUM*. *Fertile flowers very few in a head, nearly sessile, after flowering reflexed, calyx mouth naked; sterile flowers surrounding and embracing the fertile ones.*

16. *T. suberra'neum*, Linn. (Fig. 1138.) *Subterraneous Trefoil*. Heads of few flowers erect, deflexed after flowering, and surrounded by several abortive reflexed calyces, forming a sub-globose head; teeth bristle-shaped, spreading in a star-like manner, hairy; leaflets obcordate; stipules broadly lanceolate, acute; stem prostrate, hairy.

English Botany, t. 1048.—English Flora, vol. iii. p. 800.—Hooker, British Flora, ed. 4. vol. i. p. 275.—Lindley, Synopsis, p. 80.

Root fibrous. *Stems* several, round, branched, spreading close to the ground, leafy, and more or less hairy, like the rest of the plant. *Leaves* on long slender spreading footstalks, leaflets all nearly sessile, inversely heart-shaped, the mid-rib prominent, and numerous lateral fine veins, the margin obscurely toothed. *Stipules* large, ovate, membranous, veiny, hairy. *Inflorescence* axillary heads of from two to five flowers, on a slender peduncle, erect when in flower, elongated and deflexed in fruit. *Flowers* small, white. *Calyx* of the perfect fruit nearly tubular, pale green or white, five ribbed, terminating in five long slender bristle-like teeth, and hairy, becoming somewhat

inflated in fruit, as the peduncles become deflexed after flowering, the calyces become reflexed, and from the extremity of the peduncle several other abortive calyces are put out, having their five teeth spread in a star-like manner, resembling roots, these at length are also reflexed, and surround the fruit bearing calyces, forming a globose head. *Legume* containing a single black ovate seed.

Habitat.—Dry gravelly and sandy pastures in various parts of England.

Annual; flowering in May.

It is interesting to observe the growth of this plant, spreading its long slender branches on the surface of the ground, and from the axis of the leaves putting out its cluster of about three flowers, on a peduncle, which is at first short and erect, afterwards it elongates, and is recurved, and from the base of each of the calyces, which become reversed, are protruded small filaments, like roots; these penetrate the ground, and the calyx teeth are much elongated; but we have not been able to ascertain if the calyx expands into a new plant or not.

GENUS XIII. TRIGONELLA.—LINN. *Fennigreek*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* campanulate, five-cleft. *Keel* very small, the wings and vexillum together imitating a tripetalous corolla. *Legume* oblong, compressed, or cylindrical, acuminate, nearly erect, many seeded.—*De Cand*.—Name from *τρεῖς*, three; and *γωνία*, an angle; so called from the triangular shape of the flowers.

1. *T. ornithopodioides*, Dec. (Fig. 1139.) *Bird-foot Fennigreek*, or *Trefoil*. Flowers from two to four together from the axis of the leaves; legumes somewhat curved, compressed, twice as long as the calyx, about eight seeded; leaflets obcordate, toothed; stipules sub-membranous, lanceolate, taper pointed.

De Candolle Prodomus, vol. ii. p. 184.—*Lindley*, Synopsis, p. 82.—*Trifolium ornithopodioides*, Linn.—*English Botany*, t. 1047.—*Hooker*, British Flora, ed. 4. vol. i. p. 274.—*Falcatala falsotrifolium*, Brot.

Root tapering, and fibrous. *Stems* several, from four to eight inches long, round, smooth, branched and leafy, spreading close to the ground. *Leaves* with long slender footstalks, leaflets three, all nearly sessile, obcordate, coarsely toothed upwards, smooth, with a stout mid-rib, and slender lateral veins. *Stipules* sub-membranous, veiny, lanceolate, with a long tapering point. *Inflorescence* axillary stalks, bearing from one to four flowers, which are elevated on a short partial footstalk from the axis of a thin membranous two pieced

involucre. *Calyx* campanulate, pale, sub-membranous, smooth, ten ribbed, teeth short, lanceolate, acute. *Corolla* pale pink, the keel short, with a slender claw, the wings ovate, obtuse, notched at the base, the claw slender, the vexillum oblong, narrowed towards the base. *Legume* as long again as the calyx, compressed, smooth, dark brown, curved in a falcate manner, and containing eight oval seeds.

Habitat.—Sandy pastures, not very common; found chiefly on the eastern coast, about Edinburgh, Scotland; Killiney Hill, and by the Murrow of Wicklow.

Annual; flowering in June.

This small plant is rendered more difficult to find, from its spreading itself close to the ground. It has been joined with the genus *Trifolium*; but the structure of its flowers and fruit separate it from that genus, and its habit is not that of the one to which it is now allied.

GENUS XIV. LOTUS.—LINN. *Bird'sfoot Trefoil*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* tubular, or campanulate, five cleft or five toothed.

Corolla with a beaked keel, and wings about as long as the vexillum. *Stamens* diadelphous. *Legumes* cylindrical, or compressed, linear, somewhat spongy within, valves curved spirally on bursting. *Seeds* mostly numerous.—“Name supposed to be one of the three kinds (the herbaceous) of the *Λερες*, of the Greeks.”—Hook.

1. *L. corniculatus*, Linn. (Fig. 1140.) *Common Bird'sfoot Trefoil*. Stem prostrate, smooth or hairy; heads depressed, umbellate, on long peduncles, six to ten flowered; calyx campanulate, the teeth awl-shaped, with a triangular base as long as the tube; claw of the vexillum inflated above; leaves obovate, or linear, smooth or hairy; legume linear, cylindrical, straight, smooth.

α. *vulgaris*. The whole plant smooth, or nearly so; leaves obovate.

L. corniculatus, Linn.—English Botany, t. 2090.—Hooker, British Flora, ed. 4. vol. i. p. 278.—English Flora, vol. iii. p. 313.—Lindley, Synopsis, p. 81.

β. *villosus*. The whole plant clothed with long spreading hairs; leaves obovate.

L. corniculatus, γ.—De Cand. Prod. 2. p. 214.—Hooker, British Flora, ed. 4. vol. i. p. 278.

L. villosus, Thuill.

γ. *ciliatus*. Leaves obovate, ciliated, as well as the calyx, with long slender hairs.

L. ciliatus, Tenor.—Prod. p. 44.

δ. tenuifolius. (Fig. 1141.) Stem slender, filiform; leaves and stipules linear lanceolate, smooth, or sparingly scattered over with hairs.

L. tenuis, Kit. et Willd.—English Botany, Suppl. t. 2615.—Hooker, British Flora, ed. 4, vol. i. p. 278.—Lindley, Synopsis, p. 82.—*L. depressus et humifusus*, Willd.—*L. decumbens*, Forst.—English Flora, vol. iii. p. 314.—*L. corniculatus*, ξ.—De Cand. Prod. 2. p. 214.

Root tapering, and with branched fibres. *Stems* several, from six to twelve inches long, spreading in every direction, prostrate or decumbent at the base, erect above, round, or somewhat angular, simple or branched, quite smooth, and of a glaucous green, or more or less clothed with soft spreading hairs. *Leaves* numerous, with short compressed petioles, with a pair of *stipules* at the base, and like the sessile leaflets obovate, oblong, or linear, a dark green, somewhat glaucous beneath, and smooth, or ciliated, or more or less hairy. *Inflorescence* depressed umbellate heads, with an involucrate leaf at the base, of from six to ten flowers, elevated on a long slender peduncle, arising from the axis of the leaves. *Flowers* bright yellow, the vexillum darker coloured, and mostly striated with crimson, becoming dark green with drying. *Calyx* on short pedicles, curved downwards, campanulate, smooth, or more or less hairy, the teeth awl shaped, with a triangular base. *Corolla* three or four times as long as the calyx, keel with a long compressed point, wings oblong, obtuse, shorter than the ascending obovate vexillum, with its broad vaulted claw. *Legume* about an inch long, cylindrical, smooth, with an elevated suture on each side, of a purplish brown colour. *Seeds* numerous, kidney-shaped, smooth.

Habitat.—Pastures and waste places, abundant; *β. δ.* less frequent. Perennial; flowering from July to August.

This is an extremely variable plant, in the greater or less development of its leaves, and in being quite smooth or more or less hairy; these varieties seeming to depend upon the soil in which they have grown being more or less moist. The lotus has been strongly recommended by some writers as a valuable agricultural plant, both for permanent pastures and hay; but by others, as Miller, it has been equally depreciated for such purposes. It would, however, seem this trefoil is in many pastures of considerable value, and affords a good supply of herbage in succession; for like some other plants, the more it is cropped down the greater is its effort to repair its loss: and for this purpose its root becomes much elongated, stronger and stouter, and the number of its branches greatly increased, so that in many, and especially moist, pasture lands it must yield a valuable produce.

2. *L. maj'or*, Scop. (Fig. 1142) *Greater Bird'sfoot Trefoil*. Stem erect, smooth or hairy; heads depressed, umbellate, on long pedun-

cles, six to twelve flowered; calyx campanulate, the teeth awl shaped, with a triangular base as long as the tube; claw of the vexillum linear, inflated above; leaves obovate, smooth or hairy; legumes linear, cylindrical, straight, smooth.

English Botany, t. 2091.—English Flora, vol. iii. p. 313.—Hooker, British Flora, ed. 4. vol. i. p. 278.—Lindley, Synopsis, p. 82.—*L. corniculatus*, *β. major*, Ser.—De Cand. Prod. 2. p. 214.

Similar to the last in all its parts, except being an erect, much larger, and stouter plant, with hollow stems, and the claw of the vexillum being narrower, but still vaulted above. It is a very doubtful species, and perhaps ought only to be considered a variety of *L. corniculatus*.

Habitat.—Sides of ditches, moist places, under hedges, &c.; frequent.

Perennial; flowering in July and August.

3. *L. angustis'simus*, Linn. (Fig. 1143.) *Slender Bird'sfoot Trefoil*. Hairy, stem prostrate; heads of one to four flowers, on peduncles, about twice as long as the leaves; leaflets and stipules linear, ovate; calyx campanulate, with long slender awl-shaped teeth; legumes very slender, linear, compressed, mostly solitary.

Hooker, British Flora, ed. 4. vol. i. p. 279.—English Flora, vol. iii. p. 315.—Lindley, Synopsis, p. 82.—*L. diffusus*.—English Botany, t. 925.

Much smaller in all its parts than any of the other species, the stem and all other parts of the plant clothed more or less profusely with long slender spreading hairs. *Stem* prostrate, much branched, slender. *Leaves* small, ovate, pointed, or linear ovate. *Flowers* small, from one to four, on slender peduncles, about as long again as the leaves. *Calyx* with a bell-shaped tube and slender awl shaped teeth, about as long again as the tube. *Legume* small, slender, cylindrical, compressed, with a prominent suture on each side.

Habitat.—South of England, very rare; near Hastings, Sussex; Kingsteignton and Bishopsteignton, Devon; near the Lizard, and Penzance, Cornwall; Dartmouth, and the Channel Islands; Strand, near Passage, County of Cork, Ireland.

Annual; flowering in May and June.

This small species is readily distinguished from any of the other, by smaller leaves and flowers, its hairiness and small slender spreading stems. Our specimens from St. Vincent's Rock, a station mentioned by Smith for this plant, are certainly *L. corniculatus* *δ. tenuifolius*.

GENUS XV. MEDICA'GO.—LINN. *Medick.*

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* five cleft or five toothed. *Keel* obtuse. *Stamens* diadelphous. *Legumes* many seeded, variable in form, always falcate, or spirally twisted.—Name *medick*, of the Greeks; so called because it was introduced into Greece by the Medes.

* *Legumes unarmed.*

1. *M. falcata*, Linn. (Fig. 1144.) *Yellow Sickle Medick*. Stem prostrate, nearly smooth; leaflets ovate, oblong, notched, mucronate, toothed towards the end; stipules lanceolate, awl-shaped, the lower ones toothed at the base; racemes many flowered, sub-capitate; legumes falcate, or slightly twisted, reticulated with veins, and slightly downy.

English Botany, t. 1016.—English Flora, vol. iii. p. 317.—Hooker, British Flora, ed. 4. vol. i. p. 279.—Lindley, Synopsis, p. 82.

Root tapering and branched, long. *Stems* mostly numerous, spreading, about two feet long, branched, and slightly downy. *Leaves* alternate, slightly downy, the footstalk furrowed, leaflets three, the two lateral ones nearly sessile, the middle one elevated on a footstalk, ovate oblong, the mid-rib stout, terminating in a mucro between the lobes of the notched apex, the veins slender, the margin towards the apex finely toothed. *Stipules* sub-membranous, pale, lanceolate, with an awl-shaped point, the lower ones often toothed on the margin. *Inflorescence* racemose clusters of numerous yellow flowers, elevated on a peduncle, about as long again as the leaves from the upper part of the stem. *Pedicles* shorter than the calyx. *Bracteas* slender, awl-shaped, membranous. *Calyx* bell-shaped, with lanceolate teeth. *Flowers* mostly yellow, sometimes a pale violet or green. *Legumes* black, downy, curved, rarely twisted, reticulated with veins, and containing from four to eight oblong seeds.

Habitat.—Pastures and borders of fields.

Perennial; flowering in June and July.

2. *M. sativa*, Linn. (Fig. 1145.) *Purple Medick or Lucerne*. Stem erect, smooth; leaflets oblong, obovate, notched, mucronate, toothed towards the end; stipules lanceolate, awl-shaped, the lower ones toothed at the base; racemes many flowered, oblong; legumes loosely, spirally, twisted, obscurely reticulated, and slightly downy.

English Botany, t. 1749.—English Flora, vol. iii. p. 317.—Hooker, British Flora, ed. 4. vol. i. p. 279.—Lindley, Synopsis, p. 82.

Root long, tapering, woody. *Stem* erect, about two feet high, round, smooth, branched, somewhat zigzag. *Leaves* smooth, elevated on a channeled footstalk, leaflets oblong, ovate, the lateral ones nearly sessile, and smaller than the central one, which is elevated on a short stalk, the mid-rib stout, terminating in a mucro between



1142

Lotus major



1143

Lotus angustissimus.



1144

Medicago falcata.



1145

Medicago sativa.



1146

Medicago lupulina



1147

Medicago maculata

the notched apex, the lateral ribs slender, parallel, the margin toothed towards the apex. *Stipules* lanceolate, awl shaped, and often toothed at the base. *Inflorescence* racemose clusters of numerous purple flowers, elevated on a peduncle, several times longer than the leaves. *Bracteas* bristle-shaped. *Calyx* bell-shaped, with long bristle-shaped teeth. *Legume* smooth or silky, compressed, spirally twisted about three times, obscurely reticulated with fine lines. *Seeds* several, flat, yellowish.

Habitat.—Hedges, pastures, and borders of fields.

Perennial; flowering in June and July.

Both this and the above species are doubtful native plants, but have become naturalized by cultivation. Lucern has long in the South of Europe enjoyed the highest reputation as an agricultural plant, where in favourable situations it thrives remarkably well, and will bear cutting several times during the summer, hence a field near the homestead is most valuable; but in England it has not enjoyed the same reputation, though by some persons it is very highly spoken of. Though it has not obtained general cultivation, many persons have given it a trial: one reason seems to be that its produce is not a sufficient return for the time and labour necessarily bestowed upon it and probably this is owing to the climate of England being too cold and damp for its sufficiently quick growth. The conditions necessary for its cultivation are a light rich deep loamy soil in a dry sunny exposure, and that this be prepared by deep trenching and well manuring. It is sown in the spring either broad cast or drilled, and the first year a crop of barley is mostly sown with it. The plan of drilling seems preferable, as the plants are then much more easily kept free from weeds, which is very important in its cultivation; it requires a top dressing either of ashes, or well decayed stable manure, every year, and also the soil lightly forked over in the spring, and occasionally during the summer. It is several years before its produce is great; but this so much depends upon the situation of its growth, the kind of soil, and dressing, that under favourable circumstances two, and in others four, years are necessary.

3. *M. lupulina*, L. (Fig. 1146.) *Black Medick*, or *Nonsuch*. Stems procumbent; leaflets obovate, wedge-shaped, toothed upwards; stipules ovate, nearly entire; spike ovate, of numerous densely crowded flowers; legumes kidney-shaped, reticulated with veins, smooth, hairy, or glandulous, single seeded.

English Botany, t. 974.—English Flora, vol. iii. p. 318.—Hooker, British Flora, ed. 4. vol. i. p. 279.—Lindley's Synopsis, p. 83.

Root tapering, fibrous. *Stem* angular, downy, from a few inches to one or two feet long, branched at the base, or simple, procumbent and spreading. *Leaves* downy, the common footstalk furrowed above, the leaflets obovate, wedge-shaped, the mid-rib stout, termi-

nating in a point often between a notch at the apex, the margin entire, or finely toothed upwards, the lateral leaflets nearly sessile, the middle one on a short stalk. *Stipules* ovate lanceolate, entire, or toothed on the margin towards the base. *Inflorescence* axillary spikes of numerous small crowded flowers, forming an ovate head, elongated when in fruit, elevated on a slender peduncle longer than the leaves. *Calyx* downy. *Legumes* ovate, kidney-shaped, netted with elevated lines, dark brown, smooth, or clothed with jointed hairs or sometimes glandular, single seeded.

Habitat.—Meadows, fields, and waste places; common.

Annual; flowering during the summer months.

This species has the general appearance and habit of *Trifolium filiforme*, and appears to be equally as valuable as that plant for agricultural purposes, especially in a dry sandy or gravelly soil; and from the abundance of seeds which it produces all the summer, it is well suited for permanent pastures.

** *Legumes spinous*.

4. *M. maculata*, Sibth. (Fig. 1147.) *Spotted Medick*. Stems procumbent; leaflets broadly obcordate, obtusely toothed; stipules ovate lanceolate, cut, and toothed; peduncles three to six flowered, not half as long as the leaves; legumes spirally twisted, globose, depressed at each end, smooth, obliquely veined, the margin four ribbed, and crowded with a double row of subulate spines, curved and spreading.

English Flora, vol. iii. p. 319.—Hooker, British Flora, ed. 4. vol. i. p. 279.—Lindley, Synopsis, p. 83.—*M. polymorpha*, Linn.—English Botany, t. 1816.—*M. arabica*, Withering.—*M. hispida*, Gærtn.

Root fibrous. *Stem* procumbent, from six to twenty inches long, angular, furrowed, branched, leafy, and spreading, smooth, or sometimes downy. *Leaves* alternate, with long slender channeled petioles, leaflets three, broadly obcordate, smooth or silky, dark green above, and marked with an irregular lunate dark purplish brown spot, paler beneath the margin, unequally and obtusely toothed, the lateral ones nearly sessile, the middle one on a short footstalk. *Stipules* ovate lanceolate, irregularly cut into awl-shaped teeth, spreading, smooth or silky, ribbed. *Inflorescence* axillary clusters of from two to six flowers, elevated on a peduncle, about one-third the length of the leaves. *Flowers* small, yellow, each on a short pedicle, from the axis of an awl-shaped bractea. *Legume* globose, compressed, and somewhat concave at each end, spirally twisted into five rather loose whorls, the margin with four elevated lines, and a double row of arched awl-shaped spines, alternately spreading in opposite directions, the sides paler than the margin, and netted with elevated very oblique almost circular lines, when ripe a dark brown, almost black, smooth, or somewhat downy. *Seeds* yellow, kidney-shaped.



1148

Medicago denticulata.



1149

Medicago minima



1150

Onobrychis sativa.



1151

Ornithopus perpusillus.



1152

Astrolobium ebracteatum.



1153

Hippocrepis comosa.

Habitat.—Gravelly pastures in the Midland and Southern Counties of England; Ormeshead, North Wales; and the County of Fife, Scotland.

Annual; flowering in May and June.

5. *M. denticulata*, Willd. (Fig. 1148.) *Toothed Medick*. Stem procumbent, smooth; leaflets obcordate, obtusely toothed; stipules oblong, cut into numerous bristle-shaped teeth; peduncles many flowered, as long as the leaves; legumes spirally twisted, globose, depressed at each end, smooth, netted with oblique and transverse veins, the margin three ribbed, and crowded with a double row of awl-shaped spines, hooked at the apex.

English Botany, t. 2634.—Hooker, British Flora, ed. 4. vol. i. p. 280.—Lindley, Synopsis, Suppl. p. 323.—*M. maculata*, β —English Flora, vol. iii. p. 319.—*M. apiculata*, Willd.—*M. echinata*, Bouch.—*M. distans*, Poir Dict.—*M. flexuosa*, Teu.

Root fibrous. *Stem* procumbent, smooth, angular, furrowed, from a few inches to two feet long, branched and leafy. *Leaves* smooth, the footstalk about half an inch long, channeled, leaflets obcordate, sometimes rounded at the base, as well as apex, and more or less acutely or obtusely toothed on the margin towards the apex, dark green above, paler beneath, with a prominent mid-rib, terminating in a point, the lateral leaflets nearly sessile, the middle one on a short stalk. *Inflorescence* slender axillary peduncles, about as long as the leaves, bearing from two to six or more small yellow flowers, becoming longer than the leaves when in fruit. *Stipules* oblong, cut into numerous bristle-shaped teeth. *Flowers* on a short pedicle from the axis of a minute lanceolate bractea. *Fruit* globose, compressed at each end, spirally twisted in from one to three turns, closely separated from each other, of a dark brownish black colour, netted over on the surface with oblique and transverse elevated lines, the margin with three elevated lines, and two rows of awl-shaped spines, spreading, furrowed at the base, and hooked at the apex. *Seed* oblong, kidney-shaped, yellow.

Habitat.—Exposed sandy banks on the coast of Kent; near Weymouth; Cley, Norfolk.

Annual; flowering from April to June.

This is much the most common species of *Medicago* in the middle and south of Europe, and is commonly grown as a spring crop, for cutting green for cattle, and for making into hay. Its produce seems to be greater in these warm countries than those of the *Trifolium filiforme*. It is found in the North of Persia, Africa, and has been accidentally introduced into the tropical regions.

6. *M. minima*, Linn. (Fig. 1149.) *Little Bur-Medick*. Stem erect, or procumbent, hairy; leaflets obovate, toothed; stipules ovate lanceolate, entire, or slightly toothed; peduncles one to five flowered,

longer than the leaves; legumes subglobose, spirally twisted into five loose turns, hairy, the margin keeled, and with a double row of close spreading straight awl-shaped spines, furrowed on each side at the base, and hooked at the apex.

English Botany, t. 2635.—Hooker, British Flora, ed. 4. vol. i. p. 280.—Lindley, Synopsis, p. 83.—*M. muricata*.—English Flora, vol. iii. p. 320. (?)

Root fibrous. *Stem* from four inches to two feet long, procumbent, or erect, more or less angular and furrowed, and mostly much branched, clothed with soft close pubescence. *Leaves* on short petioles, downy, leaflets obovate, or sometimes obcordate, entire or toothed towards the apex, dark green above, paler beneath, with a prominent mid-rib, terminating in a short point, the lateral ones nearly sessile, the middle one on a short stalk. *Stipules* ovate lanceolate, entire, or slightly toothed, united at the base. *Inflorescence* axillary clusters of from two to six small yellow flowers, elevated on a peduncle, as long or mostly longer than the leaves. *Flowers* elevated on a short pedicle from the axis of a minute bractea. *Fruit* sub-globose, hairy, spirally twisted into four turns, pale, and slightly reticulated on the surface, the margin acutely keeled, with a distant rib on each side, and from these a double row of spines arise, one margin of the spine arising from the central rib, and the other from the lateral one forming a furrowed straight spine of greater or less length, hooked at the point. *Seed* kidney-shaped, yellow.

Habitat.—Sandy waste places, rare; Narburgh, Norfolk; near Newmarket, Romney Warren, and between Sandwich and Pegwell, Kent; Landguard Fort, Suffolk; and Pegwell Bay, Isle of Thanet.

Annual; flowering in June and July.

This is a common species in the Southern parts of Europe, growing more or less luxuriantly according to the soil and situation. We have collected it from the ruins of the Colosseum, at Rome, not more than three inches high; and upon the sandy banks near the Mediterranean it grows more than two feet long, much branched, and spreading. It may be observed (giving some idea of the extent of that vast mass of ruin, the Colosseum, at Rome,) that there are not less than two hundred species of plants growing upon its crumbling walls.

GENUS XVI. ONOBRYCHIS.—TOURN. *Saintfoin*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* five-cleft, equal. *Keel* obliquely truncated, wings short. *Stamens* diadelphous. *Legume* sessile, of one joint, indehiscent, coriaceous, compressed, one seeded, the upper margin thick and straight, the lower thinner, curved, toothed, spiny, or

lobed.—Name from *ovos*, an *ass*; and *βρωχω*, to *eat*; so called on account of the plant forming a valuable fodder.

1. *O. sativa*, Lam. (Fig. 1150) *Common Saintfoin, Cock's-head*. Stem ascending; leaves pinnated, nearly smooth; wings of the corolla not longer than the calyx; legume semi-orbicular, the keel toothed, as well as the netted elevated lines on the sides.

Hooker, *British Flora*, ed. 4. vol. i. p. 274.—Lindley, *Synopsis*, p. 88.—*Hedysarum Onobrychis*, Linn.—*English Botany*, t. 96.—*English Flora*, vol. iii. p. 292.

Root somewhat woody, fibrous. *Stems* several, ascending, round, smooth, striated, hollow, leafy, slightly branched, from two to three feet long. *Leaves* pinnate, four to six inches long, the common foot-stalk striated, and channeled above, bearing numerous pairs of elliptic oblong leaflets, each on a short slender footstalk, the mid-rib prominent, terminating in a short point. *Stipules* membranous, ovate, lanceolate, entire. *Inflorescence* an elongated racemose spike of numerous crowded flowers, elevated on an axillary peduncle, round, striated, hollow, longer than the leaves. *Flowers* a deep rose colour, variegated, each elevated on a short pedicle, from the axis of an awl-shaped *bractea*, downy, as well as the campanulate *calyx*, five ribbed, and with five awl-shaped teeth, longer than the tube of the calyx. *Corolla* with remarkable short wings, not longer than the calyx, the vexillum rather longer than the obliquely truncated keel, erect, and somewhat reflexed. *Legume* small, semi-orbicular, single seeded, hard, with a keeled margin, which is sharply toothed, the side netted with elevated lines, and also more or less furnished with teeth.

Habitat.—Dry sunny pastures and waste places in a calcareous soil in various parts of England.

Perennial; flowering in June and July.

Saintfoin is one of the artificial grasses, so called by its French name from its having been brought into notice as an agricultural plant, by seeds brought from France. It is a highly nutritive food for cattle, either when used in a green state, or dried and made into hay. According to the analysis of Sir H. Davy, it contains as much nutriment as the Clovers, and it is on account of its long descending roots well suited for dry chalky or gravelly districts, where the red and white Clovers endure for a very short period. The usual endurance of Saintfoin for profitable cultivation is from eight to ten years, and during this period even in very poor soils the surface becomes clothed with various grasses, thus rendering a longer continuance of it less necessary. The advantages of Saintfoin in dry stony lands are its patient endurance of long droughts, and that it is equally useful for grazing or mowing: when it is used for grazing, and especially for sheep it requires no top dressing of manure; but if it is mown, it is then needful to give it a dressing of well decayed stable manure or ashes.

GENUS XVII. ORNITHO'PUS.—LINN. *Bird's foot.*

Nat. Ord. PAPILIONA'CEÆ. LINN.

GEN. CHAR. *Calyx* elongated, tubular, five toothed, unequal. *Keel* short, compressed. *Stamens* diadelphous. *Legumes* elongated, curved, compressed, contracted at the joints, each joint single seeded, and separating equally, truncate at each end.—Name from *ορνις*, *ορνιθος*, a *bird*; and *πους*, a *foot*; so called from the resemblance of the pod to a bird's foot.

1. *O. perpusillus*, Linn. (Fig. 1151.) *Common Bird's foot.* Leaves pinnate, with from three to nine pairs of leaflets, and a terminal one; flowers capitate, bracteated, on a peduncle, longer than the leaves; legumes curved upwards.

English Botany, t. 369.—English Flora, vol. iii. p. 290.—Hooker, British Flora, ed. 4. vol. i. p. 273.—Lindley, Synopsis, p. 87.

Root tapering and fibrous. *Stems* numerous, from three inches to a foot and half long, procumbent, spreading, mostly simple, leafy, somewhat furrowed, and often downy. *Leaves* pinnate, downy, leaflets elliptic, ovate, in from three to twelve pairs, and an odd one mostly larger than the others. *Stipules* small, awl-shaped, or lanceolate. *Inflorescence* three or four small flowers in a head in the axis of a *bractea*, pinnated in the form of a small leaf. *Peduncle* round, slender, longer than the leaves. *Flowers* small, pale pink, veined with crimson, the keel greenish. *Calyx* downy, campanulate, with ovate lanceolate teeth. *Legumes* downy, linear, compressed, curved, and contracted at each of the joints, when dry netted lengthwise with elevated lines, the hardened point about as long as the joint, each joint is single seeded, and breaks off at each end in a truncated manner.

Habitat.—Sandy banks and waste places; frequent in England, less common in Scotland.

Annual; flowering in June.

GENUS XVIII. ASTROLO'BIUM.—DESV. *Joint Vetch.*

Nat. Ord. PAPILIONA'CEÆ. LINN.

GEN. CHAR. *Calyx* elongated, tubular, five toothed, unequal. *Keel* short, compressed. *Stamens* diadelphous. *Legumes* elongated, curved, cylindrical, contracted at the joints, each joint single seeded, and separating with cylindrical truncated ends.

1. *A. ebracteatum*, De Cand. (Fig. 1152.) *Sand Joint Vetch.* Peduncles about as long as the leaves; stipules very minute; leaves pinnated, with many pairs of equal elliptic oblong leaflets, the lower ones remote from the stem; legume cylindrical, curved; stem filiform.

Hooker, British Flora, ed. 4. vol. i. p. 278.—De Cand. Prod. 2. p. 311.—*Ornithopus lævigatus*, Smith in Rees. Cycl. n. 3.—*Scorpiurus pinnata*, Mill. Diet.

Habitat.—Sandy ground near Grand Havre, Guernsey, but rare.—*Babington and Christy*.

Annual; flowering in July and August.

GENUS XIX. HIPPOCREPIS.—LINN. *Horse-shoe Vetch*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* short, campanulate, five toothed, bilabiate. *Keel* acuminate, two lobed. *Stamens* diadelphous. *Legume* elongated, compressed, jointed, curved, the outer edge deeply notched. *Seeds* oblong, cylindrical, curved.—Name from *ἵππος*, a horse; and *κρηπίς*, a shoe; so called from the curves of the fruit resembling a horse's shoe.

1. *H. como'sa*, Linn. (Fig. 1153.) *Tufted Horse-shoe Vetch*. Stem herbaceous, spreading; peduncles longer than the leaves, the apex umbellate; legumes five to eight, curved, sinuated at each margin, rough, the joints contracted and smooth.

English Botany, t. 31.—English Flora, vol. iii. p. 291.—Hooker, British Flora, ed. 4. vol. i. p. 278.—Lindley, Synopsis, p. 88.

Root long, slender, woody. *Stems* much branched at the base, striated and furrowed, smooth, procumbent and spreading, from six to twelve inches long. *Leaves* numerous, pinnate, with long smooth furrowed footstalks, leaflets smooth, pale glaucous green, obovate, obtuse, abrupt, or notched, each on a short hairy footstalk, in from four to six pairs, and an odd one. *Stipules* ovate lanceolate, membranous. *Inflorescence* umbellate, of about eight pale yellow flowers at the apex, of a smooth furrowed peduncle, much longer than the leaves, pedicles short, hairy, arising from the axis of a small triangular bractea, forming an involucre to the umbel. *Calyx* short, campanulate, hairy, with five short lanceolate teeth. *Corolla* yellow, the vexillum erect, somewhat reflexed, a deeper yellow than the rest of the flower, and striated, the claw vaulted, wings obovate, obtuse, with narrow claws, keel acuminate into a two lobed point. *Legume* about an inch long, curved inwards, from three to five jointed, each joint deeply sinuated on the inner margin, the outer one less so, and forming the joint, rough, with numerous elevated glands, pink (when dry), the joints contracted and smooth.

Habitat.—Chalky and limestone banks and pastures in various parts of England; Dundonald, Scotland.

Perennial; flowering in July.

GENUS XX. VICIA.—LINN. *Vetch*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* tubular, five-cleft or five-toothed, unequal. *Stamens* diadelphous. *Style* filiform, villous on the upper side, and with a tuft of hairs below the stigma on the under side. *Legume* oblong, one celled, many seeded. *Seeds* with an oval or linear lateral hilum.

* *Peduncles elongated, many flowered.*

1. *V. sylvatica*, Linn. (Fig. 1154.) *Wood Vetch*. Peduncle many flowered, longer than the leaves; leaves pinnate, with about eight pairs of ovate obtuse veiny leaflets; stipules semi-lunate, deeply cut at the base into bristle-shaped teeth.

English Botany, t. 79.—English Flora, vol. iii. p. 279.—Hooker, British Flora, ed. 4. vol. i. p. 270.—Lindley, Synopsis, p. 84.

Root creeping, the whole plant smooth. *Stems* numerous, weak, spreading, angular, striated, branched, and leafy, climbing six or eight feet high. *Leaves* numerous, petiole, channeled above, terminating in long slender branched tendrils, leaflets ovate oblong, obtuse, veiny, the mid-rib terminating in a bristle point, nearly sessile, in about eight pairs. *Stipules* half-moon-shaped, the upper lobe lanceolate oblong, mostly entire, the lower lobe cut into numerous bristle-shaped teeth, with a triangular base. *Inflorescences* simple racemes of numerous rather distant flowers, on a striated peduncle, longer than the leaves, pedicels short, slender, hairy. *Calyx* somewhat bell-shaped, the mouth oblique, and teeth unequal, bristle-shaped. *Corolla* rather large, white, beautifully pencilled with blue veins, the vexillum notched, the keel with an obtuse dark purple point. *Legume* about an inch long, brown, minutely dotted, and containing about four roundish seeds.

Habitat.—Bushy places in mountainous districts; Scotland, the North and North-west of England, Wales, and Ireland; near Newmarket.—*Rev. Mr. Hemstead*. Oxfordshire, and between Lyminge and Eltham, Kent.

Perennial; flowering in July and August.

The large racemes of the beautiful white striated flowers of this species render it worthy of the cultivator's notice; indeed, few hardy perennial climbing plants are more beautiful or better suited to ornament the hedges or climb up the stems of shrubs in the flower garden than this plant.

2. *V. Cracca*, Linn (Fig. 1155.) *Tufted Vetch*. Peduncles many flowered, about as long as the leaves; flowers imbricated; leaves pinnate, with about ten pairs of oblong lanceolate downy leaflets; stipules half arrow-shaped, nearly entire.



1154

Vicia sylvatica.



1155

Vicia Cracca.



1156

Vicia hirsuta.



1157

Vicia tetraspernum.



1158

Vicia Bithynica.



1159

Vicia lathyroides.

English Botany, t. 1168.—English Flora, vol. iii. p. 280.—Hooker, British Flora, ed. 4. vol. i. p. 270.—Lindley, Synopsis, p. 84.

Root creeping. *Stems* from two to four feet long, climbing, slender, angular, furrowed, and more or less downy, branched, leafy, spreading. *Leaves* pinnate, the common footstalk furrowed, long, and terminating in branched tendrils, *leaflets* oblong, lanceolate, clothed with soft silky down, veiny, alternate on each side of the footstalk, or opposite in about ten pairs. *Stipules* small, half arrow-shaped, entire, or occasionally toothed. *Inflorescence* axillary racemes of numerous blue flowers, crowded at the end of a striated peduncle, as long or longer than the leaves, and mostly turned to one side. *Calyx* with the two upper teeth short, awl-shaped from a broad base, the lower ones longer, and more lanceolate. *Corolla* a beautiful blue colour, of various tints, and often purplish, vexillum with a broad dilated claw, as long as the limb. *Legume* linear, oblong, smooth.

Habitat.—Hedges, thickets, bushy places, &c.; common.

Perennial; flowering in July and August.

This is an extremely ornamental plant in our rural lanes and hedges, producing a rich profusion of beautiful variegated flowers, and climbing over and adorning, with luxurious elegance, the shrubs and the sturdy bushes of the heath. It is very variable in size and luxuriance, according to the kind of soil and situation in which it grows. Some specimens which we collected in a rich meadow, near Sheffield, have the leaflets in the lower part of the stem ovate lanceolate, and almost smooth, the stem stout, deeply furrowed, and the peduncles longer, stouter, and bearing more numerous flowers than in the more frequent state of the plant; but in poor heathy soil we find it sometimes not a foot long, thin, slender, and the whole plant starved and dwarfish in its appearance.

*** Peduncles elongated, few flowered.*

8. *V. hirsuta*, Koch. (Fig. 1156.) *Hairy Tare*. Peduncles two to eight flowered; petioles terminating in a branched tendril, bearing about eight pairs of linear oblong obtuse or truncated leaflets; stipules lanceolate, the lower ones half arrow-shaped and toothed; legumes oblong, oblique, two seeded, and hairy.

Koch. Flora Germanica et Helvetica, p. 191.—*Ervum hirsutum*, Linn.—English Botany, t. 970.—English Flora, vol. iii. p. 289.—Hooker, British Flora, ed. 4. vol. i. p. 272.—Lindley, Synopsis, p. 83.

Root small, tapering. *Stem* angular, nearly smooth, branched, climbing, spreading, two to three feet high. *Leaves* numerous, the petioles long, slender, channeled, terminating in a branched tendril, and bearing about eight pairs of linear oblong obtuse truncated or notched leaflets, pale beneath the mid-rib, terminating in a short point. *Stipules* of the upper leaves lanceolate, of the lower ones half arrow-shaped, and cut into slender teeth. *Inflorescence* axillary,

peduncles, shorter than the leaves, angular, hairy, terminating in a raceme of from four to ten small pale blue flowers, turned to one side. *Calyx* tubular, its teeth cut into slender lanceolate teeth, as long as the tube. *Corolla* white or blueish, the vexillum ovate, entire, the keel obtuse, mostly with a dark spot on each side. *Legume* ovate oblong, oblique, two seeded, downy.

Habitat.—Corn fields and hedges; very common.

Annual; flowering from June to August.

This is a very troublesome weed in corn fields, especially on a light sandy soil, and is equally as common on the Continent as with us.

4. *V. tetrasperma*, Koch. (Fig. 1157.) *Smooth Tars*. Peduncles one or two flowered; petioles terminating in a branched tendril, bearing about eight pairs of linear oblong obtuse leaflets; stipules half arrow-shaped, with linear lanceolate lobes; legumes linear oblong, oblique, smooth, four seeded, and smooth.

Koch. *Flora Germanica et Helvetica*, p. 191.—*Ervum tetraspermum*, Linn.—*English Botany*, t. 1223.—*English Flora*, vol. iii. p. 288.—*Hooker, British Flora*, ed. 4. vol. i. p. 272.—*Lindley, Synopsis*, p. 83.

Root small, tapering, the whole plant scattered over with fine soft pubescence. *Stem* angular, branched, weak, climbing, spreading, from two to three feet high. *Leaves* numerous, the petioles channelled, tapering, terminating in a branched tendril, and bearing about eight pairs of linear oblong obtuse leaflets, paler on the under side, the mid-rib terminating in a short point. *Stipules* half arrow-shaped, the lobes narrow, linear lanceolate. *Inflorescence* slender axillary peduncles, shorter than the leaves, and bearing one or two small pale blue flowers. *Calyx* tubular, unequally fine toothed. *Legume* linear oblong, smooth, four or five seeded, sometimes more or less.

Habitat.—Moist corn fields, under hedges, &c.; frequent.

Annual; flowering in June.

We have followed Koch in placing these two species with the *Vicia*, (rather than the genus *Ervum*), with which in their generic character they agree much more than with *Ervum*.

*** *Peduncles elongated, single flowered.*

5. *V. Bithynica*, Linn. (Fig. 1158.) *Rough Podded Purple Vetch*. Stem angular, spreading; lower leaves with a pair of ovate oblong leaflets, the upper with two pair of linear lanceolate ones; stipules half arrow-shaped, toothed; peduncles more or less elongated, one or two flowered; teeth of the calyx linear lanceolate, as long as the tube; legume erect, compressed, linear oblong, downy.

English Botany, t. 1842.—*English Flora*, vol. iii. p. 286.—*Hooker, British Flora*, ed. 4. vol. i. p. 272.—*Lindley, Synopsis*, p. 85.—*Lathyrus Bithunicus*, Lam.—*De Cand. Prod.* 2. p. 374.

Root long, tapering. *Stems* mostly several, angular, striated, weak, from one to two feet long, simple or branched, leafy, smooth or downy.

Leaves with an angular furrowed footstalk, terminating in a slender branched tendril, the lower ones with a pair of ovate oblong leaflets, the upper with two pairs of linear lanceolate ones, all green above, paler beneath, with a prominent mid-rib, terminating in a bristle point, and netted over with slender veins, smooth or downy. *Stipules* half arrow-shaped, more or less toothed and downy. *Inflorescence* axillary peduncles, about as long as the leaves, erect, and bearing one or two flowers. *Calyx* tubular, many ribbed, its teeth equal linear lanceolate, as long as the tube. *Corolla* with the vexillum purplish, the wings obtuse, almost white, keel obtuse, white or purplish. *Legume* erect, linear oblong, compressed, reticulated with fine veins, and more or less clothed with soft pubescence. *Seeds* several, globose.

Habitat.—Bushy places in a sandy soil; rare. Near Doncaster, Yorkshire; near Clifton-upon-Terne and Sandling, Worcestershire; on the coast in Dorsetshire and Hampshire; Frindsbury, Kent; and near Cardiff.—*Mr. Bowman*.

Perennial; flowering in July and August.

**** *Peduncles short, one or two flowered, or four to six flowers, in a short raceme.*

6. *V. lathyroides*, Linn. (Fig. 1150.) *Spring Vetch*. Stem branched; leaves with the petiole terminating in a bristle point; leaflets downy, from one to three pairs, obovate, notched; stipules entire, impressed on the under side with a green spot; flower solitary, sessile; legume linear, smooth; seeds rough, cubic-shaped.

English Botany, t. 80.—English Flora, vol. iii. p. 283.—Hooker, British Flora, ed. 4. vol. i. p. 271.—Lindley, Synopsis, p. 84.

Root small, fibrous. *Stems* several, procumbent and spreading, branched at the base, leafy, angular, about four inches long, downy, as is the rest of the plant. *Leaves* with channeled footstalks, terminating in a short point, *leaflets* of the lower leaves two, sessile, inversely heart-shaped, the mid-rib terminating in a point between the cleft, those of the upper leaves in three or four pairs, elliptical, obovate or lanceolate. *Inflorescence* solitary flowers in the axis of the upper leaves, small blueish purple, occasionally white. *Stipules* half halbert-shaped, entire, or rarely toothed, the under side impressed with a green spot. *Calyx* tubular, downy, with nearly equal teeth. *Legume* linear, smooth, dark brown. *Seeds* about six, small, dark brown, of a cubical form, rough, with granulations.

Habitat.—Road sides, banks, and dry pastures.

Annual; flowering in April and May.

7. *V. sativa*, Linn. (Fig. 1160.) *Common Vetch*. Flowers nearly sessile, axillary, mostly in pairs; leaflets in about seven pairs, obovate retuse, or oblong retuse, and bristle pointed, smooth or hairy; stipules half arrow-shaped, toothed, and more or less impressed with

a dark spot underneath; calyx cylindrical, with nearly equal lanceolate linear teeth, as long as the tube; legume oblong, erect, pubescent; seeds sub-globose, smooth.

English Botany, t. 334.—English Flora, vol. iii. p. 281.—Hooker, British Flora, ed. 4. vol. i. p. 270.—Lindley, Synopsis, p. 84.

Root fibrous, the whole plant smooth, or more or less clothed with tawny pubescence. *Stem* varying from a few inches to two or three feet high, angular, striated and furrowed, leafy, procumbent and branched below. *Leaves* alternate, with the common footstalk long, channeled, tapering, and terminating in a branched tendril, *leaflets* from four to twelve, opposite or alternate, obovate or oblong retuse, and frequently the upper leaves with linear lanceolate ones, all with the mid-rib prominent on the under side, and terminating in a bristle point of greater or less length. *Stipules* half arrow-shaped, and more or less toothed, the under side impressed with a dot of a dark or pale colour. *Inflorescence* axillary, nearly sessile, flowers solitary, or in pairs. *Calyx* tubular, oblique at the base, ribbed, the teeth linear lanceolate, erect, straight, about as long as the tube. *Corolla* smooth, purplish blue, or red. *Legume* linear, erect, compressed, and slightly downy, dark brown. *Seeds* several, sub-globose, dark brown, sub-villous.

Habitat.—Waste and cultivated ground; frequent.

Annual; flowering in June.

This is an extremely variable plant in the size and shape of its leaves and flowers, which seems to depend upon the kind of soil and situation in which it has grown; and we have sought in vain for any specific characters by which the narrow leaved varieties can be distinguished from the following species; it perhaps would be better to follow De Candolle, and unite the two species and their varieties under the same name.

This is a common and valuable agricultural plant, commonly known by the name of *tare*, *fetch*, or *vetch*, of which there are the winter and summer varieties; the former is sown for a winter crop in September or October, and the latter from February to June, and used for successive cuttings. For successful cultivation vetches require a rich, rather damp soil, and are cut when in full flower. They are esteemed profitable and excellent food for milch cows and working cattle, especially during the summer or spring months. They are seldom allowed to stand until the seeds are ripe, except for the purpose of the seed for sowing or feeding pigeons.

8. *V. angustifolia*, Sibth. (Fig. 1161.) *Narrow-leaved Crimson Vetch*. Flowers nearly sessile, axillary, solitary, or in pairs; leaflets in about seven pairs, those of the lower leaves obovate, emarginate, retuse, of the upper linear lanceolate, obtuse, or truncated, smooth or hairy; stipules half arrow-shaped, toothed and impressed with a pale





1160

Vicia sativa.



1161

Vicia angustifolia.



1162

Vicia lutea.



1163

Vicia hybrida.



1164

Vicia laevigata.



1165

Vicia sepium.

spot underneath; calyx cylindrical, with slender lanceolate teeth, as long as the tube; legume linear, smooth, spreading; seeds globoso, smooth.

English Botany, t. 2614.—Hooker, British Flora, ed. 4. vol. i. p. 271.—English Flora, vol. iii. p. 282.—Lindley, Synopsis, Suppl. p. 323.—*V. Bobartii*, Forst.—English Botany, t. 2708.—Lindley, Synopsis, p. 84.

The only characters by which this can be distinguished from many of the varieties of *V. sativa*, are its more slender habit, narrower linear leaflets, the stipules having the impressed dot on the under side pale or faintly coloured, not black, the legumes more spreading, and smooth. These, however, are not sufficiently permanent to render it a good species.

Habitat.—Dry banks and sandy places; not uncommon.

Annual; flowering in June.

9. *V. lu'tea*, Linn. (Fig. 1162.) *Rough Podded Yellow Vetch*. Flowers nearly sessile, axillary, solitary, or in pairs; leaflets in from five to ten pairs, oblong, lanceolate; vexillum smooth; calyx with unequal lanceolate teeth, the two upper ones much the smallest, and converging inwards; legume elliptic oblong, hairy, the hairs with a bulb at the base; stipules with a dark spot on the under side.

English Botany, t. 481.—English Flora, vol. iii. p. 284.—Hooker, British Flora, ed. 4. vol. i. p. 271.—Lindley, Synopsis, p. 85.

Root of creeping fibrous branches. *Stems* several, much divided at the base, slender, angular, striated, spreading, smooth, or scattered over with hairs, leafy, from one to two feet long. *Leaves* with the common footstalk channeled, and terminating in a branched tendril, leaflets of the lower leaves ovate, of the upper oblong lanceolate, downy beneath, the mid-rib terminating in a bristle point, in from five to ten pairs, opposite or alternate. *Stipules* half arrow-shaped, small, having on the under side an impressed dark brown spot. *Inflorescence* one or two nearly sessile flowers in the axis of the leaves. *Calyx* tubular, with an oblique base and mouth, nearly smooth ribbed, the teeth unequal, the three lower lanceolate, taper pointed, the two upper ones much smaller, short, and curved over each other. *Corolla* of a pale sulphur colour, striated with grey, erect, smooth. *Legume* elliptic oblong, tumid, clothed with spreading hairs, each hair formed of alternately compressed joints, arising from a tumid glandular base. *Seeds* ovate, dark brown, velvety.

Habitat.—Rocky and stony places, especially near the sea in Suffolk, Sussex; on Glastonbury Tor-hill, Mearnsire; between Montrose and Arbroath; hills at Queen's Ferry and Dunure Castle; abundant.

Perennial; flowering in June and July.

Readily distinguished from the following species, to which it is nearly allied, by its large smooth yellow flowers, the hairs of the

legumes having a bulbous base and the dark stained stipules. It is a common plant in the South of Europe, and is usually larger and stouter than with us ; but otherwise the plants are not different.

10. *V. hybrida*, Linn. (Fig. 1163.) *Hairy-flowered Yellow Vetch*. Flowers on a short peduncle, axillary, solitary ; leaflets in from five to seven pairs, ovate or oblong, notched ; vexillum downy ; calyx with unequal awl-shaped teeth ; legumes elliptic oblong, hairy, the hairs simple ; stipules ovate, toothed, without a dark spot on the under side.

English Botany, t. 482.—English Flora, vol. iii. p. 284.—Hooker, British Flora, ed. 4. vol. i. p. 271.—Lindley, Synopsis, p. 85.

Root creeping, with branched fibres. *Stems* mostly several, branched at the base, angular, furrowed, smooth, spreading, leafy, from one to three feet long. *Leaves* with the common footstalk long, tapering, and terminating in branched tendrils, *leaflets* in from five to seven pairs, or scattered, ovate or oblong, the point abrupt, or more or less deeply notched, the mid rib terminating between the lobes in a bristle point, of greater or less length, smooth, or more or less downy. *Stipules* ovate, acute, simple or toothed, the under side impressed with a pale spot. *Inflorescence* solitary axillary, flowers on a short peduncle. *Calyx* tubular, hairy, oblique at the base and mouth, its teeth unequal in length awl-shaped. *Corolla* sulphur coloured, the vexillum hairy, and more or less of a tawny colour. *Legume* elliptic oblong, tumid, clothed with simple pubescence, pendulous. *Seeds* globose, compressed, velvety.

Habitat.—Thickets ; rare. Glastonbury Tor-hill, and Swanpool, Lincoln.

Perennial ; flowering in June and July.

This plant is common in various parts of the South of Europe, growing on banks and sandy places ; but we have some doubts of its being truly wild in England, except on Tor-hill.

11. *V. levigata*, Sm. (Fig. 1164.) *Smooth Podded Vetch*. Flowers on a short peduncle, axillary, solitary ; leaflets in from three to six pairs, elliptic oblong, obtuse, smooth ; vexillum smooth ; calyx with unequal awl-shaped teeth ; legumes elliptic oblong, smooth ; stipules ovate, acute, pale green, or brown.

English Botany, t. 483.—English Flora, vol. iii. p. 285.—Hooker, British Flora, ed. 4. vol. i. p. 271.—Lindley, Synopsis, p. 85.

Root fibrous. *Stems* several, branched at the base, angular, smooth, from three to twelve inches long, leafy, trailing, or erect. *Leaves* with channeled footstalks, tapering, and terminating in a branched tendril, bearing from three to six pairs of smooth elliptic oblong leaflets, obtuse or roundish, but not notched, the mid-rib terminating in a bristle point. *Stipules* ovate, acute, lobed at the base, green, or pale brown beneath. *Inflorescence* solitary axillary, flowers

on a short peduncle, almost erect, a pale blue, whitish, or sometimes yellow, quite smooth. *Calyx* tubular, with unequal awl-shaped teeth. *Legume* reflexed, tumid, quite smooth. *Seeds* sub-globose, dark brown.

Habitat.—Sandy coast in the South of England; near Weymouth, Dorsetshire.

Perennial; flowering in July and August.

Nearly allied to the two former species, from which it is readily distinguished by its entire smoothness, its obtuse or roundish pointed leaflets, never notched, its smaller stipules, and pendulous smooth pods.

12. *V. se'pium*, Linn. (Fig. 1165.) *Bush Vetch*. Flowers in short axillary racemes of about four; leaves with about eight pairs of ovate leaflets, gradually becoming smaller upwards upon the petioles; vexillum smooth; calyx teeth unequal, awl-shaped, from a broad base, the two upper ones short, and arched inwards.

English Botany, t. 1515.—English Flora, vol. iii. p. 286.—Hooker, British Flora, ed. 4. vol. i. p. 272.—Lindley's Synopsis, p. 85.

Root fibrous. *Stem* angular, furrowed, smooth, but little branched, about two feet long. *Leaves* with channeled tapering footstalks, terminating in branched tendrils, and supporting the plant upon those around it, leaflets in from four to ten pairs, opposite or alternate ovate, or elliptic ovate, gradually smaller towards the end of the footstalk, dark green, paler beneath. *Stipules* ovate, or two lobed, acute, each with a dark brown spot on the under side. *Inflorescence* axillary racemes of from four to six flowers, all turned one way. *Calyx* tubular, hairy, the teeth unequal, awl-shaped from a broad base. *Corolla* a blueish purple, often variegated, sometimes white. *Legumes* ascending, or erect, oblong, oblique, smooth, black, about an inch long. *Seeds* several globose, smooth.

Habitat.—Thickets, under hedges, &c.; common.

Perennial; flowering in May and June.

The Bush Vetch is a very variable plant as to size, and the number of leaflets upon a leaf, as well as the colour of its flowers, variations caused by the kind of soil, and the more or less exposed situation in which they have grown. It does not appear ever to have been cultivated in this country, though in Germany we have seen it grown in considerable quantities, and cut green for cattle; but we could not ascertain that it possessed any advantages over the *V. sativa*, but probably is equally as useful, and perhaps better suited for damp shady situations.

GENUS XXII. PISUM.—LINN. *Pea*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* of five foliaceous unequal segments. *Stamens* diadelphous. *Vexillum* large, reflexed. *Style* compressed, keeled, villous on the upper side. *Legums* of one cell, oblong, compressed, many seeded. *Seeds* roundish, with a roundish hilum.—Name from the Celtic *pis*, a *pea*.

1. *P. maritimum*, Linn. (Fig. 1166.) *Sea Pea*. Stem angular; peduncles many flowered; leaves with four pair of ovate entire leaflets; stipules as large as the leaflets, cordato-hastate.

English Botany, t. 1046.—English Flora, vol. iii. p. 269.—Lindley, Synopsis, p. 83.—*Lathyrus maritimus*, Big.—Hooker, British Flora, ed. 4. vol. i. p. 270.

Root with long creeping underground stems, the whole plant smooth, of a glaucous hue. *Stem* procumbent, angular, somewhat compressed, zigzag, leafy, simple, about a foot long, mostly pinkish, with a glaucous hue. *Leaves* alternate, the common footstalk flattened above, long, tapering, and terminating in a branched tendril, *leaflets* mostly in four pairs, opposite or alternate, ovate, acute, entire, veiny. *Stipules* nearly as large as the leaflets, triangular, arrow-shaped, entire or toothed at the base. *Inflorescence* axillary racemose clusters of numerous flowers, elevated on an angular peduncle, as long as the leaves. *Calyx* cup-shaped, with unequal leafy teeth, ovate, acute, the two upper ones widest, and more widely separated than the others. *Corolla* large, purple, beautifully variegated with crimson veins, the *vexillum* large, notched, somewhat reflexed, and near the base on each side is a white protuberance, the claw concave, the wings and keel mostly of a more pinky colour than the standard. *Legume* linear oblong, oblique. *Seeds* six or eight.

Habitat.—The pebbly sea coast in the South of England; Lincolnshire, Suffolk, Castlemain, County of Kerry, Ireland, Shetland.—*Dr. McNab*.

Perennial; flowering in July.

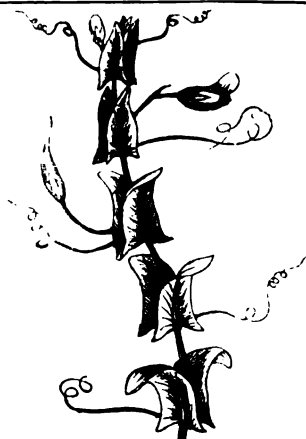
The Sea Pea, according to the tale still told in Suffolk, sprang up spontaneously in the year 1555, during a time of great scarcity; but their miraculous appearance is not credited either by Stowe or Camden, as these historians supposed them to have been cast on shore from the cargo of some wrecked vessel. It is, however, much more likely that they have grown there indigenously, and were only brought into notice by the scarcity of food, and their resemblance to the common pea would attract the attention of the hungry wanderer.

The well known Garden Pea, of which there are in cultivation numerous kinds, as the Charlton, the Marrow-fat, the Prussian-blue, and the Sugar-pea, are all varieties of the *P. sativum*. The



1166

Pisum maritimum.



1167

Lathyrus aphaca.



1168

Lathyrus nissolia.



1169

Lathyrus hirsutus.



1170

Lathyrus pratensis.



1171

Lathyrus sylvestris.

mode of cultivation and economical use of Peas are so well known as a garden vegetable, as not to need description; and the grey or field peas, the *P. arvensis*, are commonly grown for feeding pigs and pigeons, and for splitting or to be ground into flour, and used as an ingredient in soup, &c. According to the investigations of Sir H. Davy, 1,000 parts of pea-flour will give 574 parts of soluble or nutritive matter, showing it to be one of the most nutritious kinds of food, especially for pigs or cattle, which are fattening for the market. A dry sandy or loamy soil is best suited for the successful cultivation of peas, and if the season be a wet one, they require supporting with sticks.

GENUS XXIII. LATHYRUS.—LINN. *Vetchling and Everlasting Pea*

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* campanulate, its mouth oblique, unequally five-cleft. *Stamens* diadelphous. *Style* linear, flat, dilated upwards, and downy in front. *Legume* of one cell, oblong, many seeded. *Seeds* round, angular.—Name *λαβύρο*;, applied to a leguminose plant of Theophrastus, and supposed to have been of this genus.

* *Leaves* wanting, *petioles* leaflike, or cirriform.

1. *L. Apha'ca*, Linn. (Fig. 1167.) *Yellow Vetchling*. Peduncles single flowered; petiole filiform; leaflets forming a tendril; stipules large, leafy, ovate, with an angular lobed base.

English Botany, t. 1167.—English Flora, vol. iii. p. 274.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 86.

Root filiform, and fibrous. *Stems* mostly several, branched at the base, slender, thread shaped, procumbent, or climbing, smooth, angular, from one to two or three feet long. *Leaves* wanting, and in their place are slender thread-shaped tendrils, sometimes, though rarely, bearing a pair of small leaves; by means of the tendrils the plant supports itself upon others around it. *Stipules* very large, leaf-like, ovate, acute, arrow-shaped or heart-shaped at the base, with an acute lobe on each side, which is entire or toothed. *Inflorescence* long slender erect axillary peduncles, bearing a single pale yellow flower. *Bractees* small pale scales a little below the flower. *Calyx* with long lanceolate teeth, veiny. *Corolla* small. *Legume* about an inch long, linear, oblique, smooth, somewhat compressed. *Seeds* globose, from six to eight.

Habitat.—Borders of fields in a sandy soil; rare. Cambridge-shire, Oxfordshire, Norfolk, about London, Nottinghamshire.—*Dr. Howitt*.

Annual; flowering from June to August.

2. *L. Nisso'lia*, Linn. (Fig. 1168.) *Crimson Vetchling, or Grass*

Vetch. Peduncles one or two flowered; petioles leaf-like, linear lanceolate, without tendrils; stipules small, subulate.

English Botany, t. 112.—English Flora, vol. iii. p. 274.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 86.

Root fibrous. *Stem* erect, from one to two feet high, smooth, angular, striated, simple. *Petioles* linear lanceolate, sessile, striated, entire, with a tapering point, resembling leaves. *Stipules* very small, awl-shaped, sometimes wanting. *Inflorescence* slender erect peduncles, arising from the axis of the upper leaves, and bearing one or two bright crimson flowers. *Calyx* tubular, with a conical base, teeth nearly equal, lanceolate. *Legume* long, linear, nearly cylindrical, pendulous, many seeded, smooth.

Habitat.—Bushy places and grassy borders of fields in various parts of England; but not very common.

Annual; flowering in May.

This species is remarkable from its linear dilated petioles resembling and performing the office of leaves, which are grass-like, and when the plant is growing amongst grass, and before it is in flower it is very apt to be overlooked. The flowers are a beautiful bright crimson, more or less variegated with white and purple.

**** Leaves with one or many pairs of leaflets, peduncles two or many flowered.**

8. *L. hirsutus*, Linn. (Fig. 1169.) *Rough Podded Vetchling.* Peduncles two flowered, longer than the leaves; petioles winged, and bearing a pair of lanceolate leaflets; legumes linear oblong, hairy, the hairs with a bulbous base; seeds globose, rough.

English Botany, t. 1255.—English Flora, vol. iii. p. 275.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 86.

Root small, tapering. *Stem* about two feet high, somewhat hairy, winged, leafy, branched. *Leaves* with winged petioles, terminating in a branched tendril, and bearing a pair of lanceolate leaflets, three ribbed and veiny, quite smooth, or somewhat hairy. *Stipules* narrow, half arrow-shaped, and slightly hairy. *Inflorescence* slender axillary peduncles, longer than the leaves, and bearing two, sometimes one, rarely three flowers, which have the standard bright crimson, the wings pale blue, and the keel white. *Calyx* hairy, cut into deep narrow lanceolate segments. *Legume* broadly linear oblong, clothed with hairs, having a bulbous base. *Seeds* globose, rough, with elevated tubercles.

Habitat.—Cultivated fields; rare. Essex, and between Bath and Bristol.

Annual; flowering in July.

4. *L. pratensis*, Linn. (Fig. 1170.) *Meadow Vetchling.* Peduncles many flowered, longer than the leaves; petioles angular, terminating in a branched tendril, and bearing a pair of three ribbed lanceolate

leaflets; stipules arrow-shaped, large; calyx with nearly equal lanceolate awl-shaped teeth; legumes linear oblong, obliquely veined; stem angular.

English Botany, t. 870.—English Flora, vol. iii. p. 276.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 86.

β. velutinus, De Cand. The whole plant clothed with soft pubescence.

Root with long creeping underground stems. *Stem* angular, branched, leafy, from one to three feet long, climbing. *Petioles* angular, not winged, terminating in a simple or branched tendril, and bearing a pair of lanceolate leaflets, about an inch long, three ribbed, and veiny. *Stipules* arrow-shaped, almost as large as the leaflets. *Inflorescence* slender angular axillary peduncles, much longer than the leaves, terminating in a raceme of about ten yellow flowers. *Calyx* tubular, with nearly equal lanceolate awl-shaped teeth. *Legume* linear oblong, compressed, black, netted with oblique veins. *Seeds* about eight, globose, smooth. The whole plant is either smooth, or more or less clothed with soft pubescence.

Habitat.—Meadows, pastures, and thickets; common.

Perennial; flowering in July and August.

Cattle are very fond of this vetch, and it has been recommended as an excellent and profitable plant for cultivation, especially in a cold clay soil, affording an admirable fodder for cattle and sheep, and is also equally good for making into hay for winter provender. It has not, however, hitherto been generally cultivated, but is deserving of greater attention; in poor cold lands especially would be far more profitably grown than many other crops.

5 *L. sylvestris*, Linn. (Fig. 1171.) *Narrow-leaved Everlasting Pea*. Peduncles many flowered, longer than the leaves; petioles winged, terminating in a branched tendril, and bearing a pair of sword-shaped leaflets; stipules narrow, half arrow-shaped; legumes oblong, linear, smooth; seeds rugous; stem winged.

English Botany, t. 805.—English Flora, vol. iii. p. 276.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 85.

Root with long creeping underground stems. The whole plant smooth. *Stem* angular, and broadly winged, branched, spreading, climbing from five to six feet high. *Petioles* winged below, above tapering into a branched tendril, bearing a pair of long narrow lanceolate or arrow-shaped leaflets, three ribbed, and veiny. *Inflorescence* angular axillary peduncles, as long as the leaves, terminating in a raceme of from six to ten large flowers, each having at the base of its pedicel an awl-shaped bractea. *Calyx* bell-shaped, with unequal lanceolate teeth. *Corolla* pale green, variegated with pale crimson and purple. *Legume* long, linear, obliquely pointed, compressed, reticulated with veins. *Seeds* sub-globose, rugous.

Habitat.—Thickets and hedges; in the middle and south of England; Shore, near Whitehaven; North Wales; Scotland, Salisbury Craigs, and coast of Angus-shire, and banks of White Adder, Berwickshire.

Perennial; flowering in July and August.

6. *L. latifolius*, Linn. (Fig. 1172.) *Broad-leaved Everlasting Pea*. Peduncles many flowered, longer than the leaves; petioles winged, terminating in a branched tendril, and bearing a pair of ovate elliptic mucronated leaflets; stipules half arrow-shaped; legumes oblong, linear, smooth; seeds rough, with elevated tubercles; stem winged.

English Botany, t. 1108.—English Flora, vol. iii. p. 277.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 85.

Root branched and spreading. The whole plant smooth, of a somewhat glaucous hue. *Stems* angular, broadly winged, branched and spreading. *Petioles* broadly winged below, above terminating in a branched tendril, bearing a pair of ovate elliptical leaflets, three or five ribbed and veiny, terminating in a short bristle point, sometimes the leaflets are much narrower, lanceolate, or almost linear. *Stipules* narrow, half-arrow-shaped, entire, or sometimes toothed at the base. *Inflorescence* long angular axillary peduncles, terminating in a raceme of from four to eight large flowers, each having at the base of its peduncle an awl-shaped *bractea*. *Calyx* broadly bell-shaped, with short lanceolate teeth. *Corolla* rose coloured, the vexillum notched, and greenish at the back. *Legume* oblong, linear, compressed, smooth. *Seeds* globose, rough, with elevated tubercles.

Habitat.—Plantations and woods; a doubtful native. Cambridge-shire; near Whitehaven, Cumberland; Worcestershire; Bedfordshire; near Stapleton, Gloucestershire; near Kirkcudbright, Scotland.

Perennial; flowering in July and August.

The two last species are ornamental climbing plants, well suited for shrubberies, to ornament bushy places, or training up poles or trellis work. The broad-leaved Everlasting Pea is a great favourite with the rural cultivator, and few plants are more beautiful, seen as it commonly is in our rural villages carefully trained around the cottage doors, or blooming over the garden enclosure. Besides these, there are other species of Lathyrus, equally or perhaps more esteemed, as the *L. odoratus*, or Sweet Pea, a native of the South of Europe; and frequently mixed with this are the *L. palustris*, *L. heterophyllus*, and *L. hirsutus*. They are all elegant looking climbing plants; but the *L. odoratus* is the most delicate and esteemed. Of it the poet says—

“ Here are sweet peas, on top toe for a flight,
With wings of gentle flush o’er delicate white.”

7. *L. palustris*, Linn. (Fig. 1173.) *Blue Marsh Vetchling*. Peduncles many flowered, longer than the leaves; petioles rounded, bearing



1172

Lathyrus latifolius



1173

Lathyrus palustris.



1174

Orobus tuberosus.



1175 *Orobus tuberosus* var. *tenuifolius.*



1176

Orobus niger.



1177

Orobus sylvaticus.

two to four pairs of linear lanceolate leaflets; stipules half arrow-shaped, lanceolate, acuminate; legume linear, oblong, smooth; stem winged.

English Botany, t. 169 —English Flora, vol. iii. p. 278.—Hooker, British Flora, ed. 4. vol. i. p. 270.—Lindley, Synopsis, p. 86.

Root branched, spreading. The whole plant smooth, somewhat glaucous. *Stem* winged, simple, or slightly branched, from three to four feet high. *Petiole* rounded, or somewhat angular, not winged, terminating in a branched tendril, and bearing from two to four pairs of elliptic lanceolate leaflets, each with a stout mid-rib, and several slender lateral ones. *Stipules* half arrow-shaped, mostly very narrow, but variable in width, the auricle lanceolate, acuminate. *Inflorescence* axillary peduncles, longer than the leaves, terminating in a raceme of from three to eight flowers, each having at the base of its pedicel a small *bractea*. *Calyx* campanulate, with short unequal lanceolate teeth. *Corolla* pale purple, variegated with pink and white, the vexillum notched. *Legume* linear, oblong, straight, smooth.

Habitat.—Moist thickets, wet meadows, and boggy places in various parts of England; but not common. Galloway, Scotland.

Perennial; flowering in July and August.

GENUS XXIV. OROBUS.—LINN. *Bitter Vetch*.

Nat. Ord. PAPILIONACEÆ. LINN.

GEN. CHAR. *Calyx* campanulate, its mouth oblique, unequally five-cleft, obtuse at the base. *Stamens* diadelphous. *Style* slender, linear, downy above. *Legumes* cylindrical, oblong, of one cell, many seeded. *Seed* with a linear hilum.—Name from *ορω*, to strengthen, or invigorate; and *βους*, an ox; so called from its supposed great power of strengthening cattle which feed upon it.

1. *O. tuberosus*, Linn. (Fig. 1174.) *Tuberous Orobus*, or *Bitter Vetch*. Stem winged; petioles winged, terminating in a point, and bearing two to four pairs of oblong lanceolate or linear leaflets, very glaucous beneath; stipules half arrow shaped, entire, or toothed at the base; underground stems creeping, and tuberous at the joints.

English Botany, t. 1153.—English Flora, vol. iii. p. 171.—Hooker, British Flora, ed. 4. vol. i. p. 268 —Lindley, Synopsis, p. 87.

β. tenuifolius, (Fig. 1175.) Leaves linear, very narrow.

O. tenuifolius, Roth —*O. gracilis*, Gaud.—*O. setiformis*, Schleich.

β. English Flora, vol. iii. p. 271.—Hooker, British Flora, ed. 4. vol. i. p. 268.

Root with creeping underground stems, having here and there oblong fleshy tubers, black externally, the whole plant smooth, dark green. *Stems* angular, and with a narrow wing from each angle, erect, simple, about a foot high, leafy. *Petioles* angular, winged,

terminating in a compressed point, and bearing two to four pairs of leaflets, very glaucous beneath, three ribbed, and veiny beneath, the mid-rib terminating in a small bristle point, varying in width from two lines to half an inch, commonly elliptic lanceolate or oblong lanceolate. *Inflorescence* axillary peduncles from the axis of the upper leaves, than which they are longer, angular, and terminating in a raceme of from two to six flowers. *Calyx* campanulate, the base obtuse, its mouth oblique, unequally five toothed. *Corolla* pale pink, elegantly veined and variegated with purple and blue. *Legumes* pendulous, sub-cylindrical, linear, oblique, black, smooth. *Seeds* numerous, globose, smooth, dark brown, the hilum linear.

Habitat.—Woods, thickets, and mountainous pastures; common. *β*. Kinnaird, May Woods, Inverness-shire, and near Elgin, Scotland. Perennial; flowering in May and June.

The tuberous roots have, when masticated, a sweetish taste, and by the highlanders of Scotland are much esteemed; they dry them, and masticate them before drinking their whiskey, for the purpose of giving it a relish, in the same way as it is customary in many parts of Italy to masticate the dried seeds of fennel to give a relish to their wine. The poor highlanders also say that chewing these tubers for a long time allays the feeling of hunger. In some parts of Scotland, as in Ross-shire, and among the Breadalbane mountains they bruise these tubers and infuse them in water, which is fermented into a kind of liquor; and when other food is scarce they are boiled and used as a vegetable. In Holland and Flanders they also cook them and eat them in the same way as chestnuts. It is not improbable that, if this plant was cultivated, it would furnish us with excellent edible tubers.

2. *O. niger*, Linn. (Fig. 1176.) *Black Bitter Vetch*. Stem angular, branched, erect; leaves pinnate, with three to six pairs of ovate or oblong obtuse leaflets, very glaucous beneath; stipules half arrow-shaped, linear lanceolate; root fibrous; peduncles few flowered; legumes linear, cylindrical.

English Botany, t. 2788.—English Flora, vol. iii. p. 271.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 87.

Root long, tapering, and fibrous, the whole plant smooth, and becoming quite black with drying. *Stems* mostly several, from one to two feet high, angular, much branched and leafy, spreading. *Leaves* without tendrils, pinnate, the common stalk compressed, channeled, leaflets in from three to six pairs, ovate, oblong, obtuse, about an inch long, each on a short partial footstalk, dark green above, very glaucous beneath, the mid-rib prominent, and terminating in a bristle point, veiny. *Stipules* half arrow-shaped, linear lanceolate, tapering. *Inflorescence* slender angular peduncles from the axis of the upper leaves, terminating in a one sided raceme, of from four to six elegant

drooping flowers, the vexillum a purplish crimson, elegantly veined, with darker pencilled lines, the keel pale, almost white. *Calyx* campanulate, the base obtuse, the mouth oblique, with unequal teeth. *Legume* linear, cylindrical, sub-compressed, smooth, black. *Seeds* about six, oblong, compressed, smooth, dark brown.

Habitat.—Shady rock, Scotland; Den of Airly, Forfarshire; Craiganain, a rock within two miles of Moy House, Inverness-shire.

Perennial; flowering in June and July.

This species has not been many years known as a native of Britain; it was discovered by Mr. Drummond, in Scotland. On comparing our native specimens with those grown on the Continent, we find the former with much smaller leaflets, more ovate, but in every other respect the plants are the same. It is not unfrequent in Italy, Spain, and Portugal, and is found in the South of Sweden and Norway.

8. *O. sylva'ticus*, Linn. (Fig. 1177.) *Wood Bitter Vetch*. Stem angular, branched, decumbent, hairy; leaves pinnate, hairy, with seven to ten pairs of ovate oblong acute leaflets; stipules half arrow-shaped, linear lanceolate; peduncles many flowered; legumes ovate; root with creeping underground stems.

English Botany, t. 518.—English Flora, vol. iii. p. 272.—Hooker, British Flora, ed. 4. vol. i. p. 269.—Lindley, Synopsis, p. 87.

Root with creeping underground stems, woody. *Stems* mostly numerous, spreading, or decumbent at the base, from one to two feet long, leafy, branched, angular, and more or less clothed with spreading pubescence. *Leaves* with compressed channeled footstalks, mostly hairy, *leaflets* ovate oblong, acute, or lanceolate, each on a short footstalk, in from seven to ten pairs, often alternate, a cheerful green above, pale and somewhat glaucous beneath, with a prominent mid-rib, terminating in a short bristle point. *Stipules* half arrow shaped, with linear lanceolate lobes. *Inflorescence* angular axillary peduncles, shorter than the leaves, terminating in a one sided raceme of numerous cream-coloured flowers, tipped with purple, and striated with the same coloured veins. *Calyx* campanulate, the base obtuse, the mouth oblique, with unequal teeth. *Legume* ovate oblong, stalked, smooth, sub compressed, short. *Seeds* about three, nearly globular, smooth, dark brown.

Habitat.—Rocky and mountainous woods and thickets in the North of England, Scotland, North Wales, and near CloghJordan, King's County, Ireland.

Perennial; flowering in May and June.

These two last species of *Orobus* are both beautiful plants, with elegant racemes of delicate flowers. They are, as are many other species of this plant, found in the wild parts of mountain woods, where nature in her sublimity reigns unconquered and unconquerable.

"Yes, lightly softly move!
 There is a power, a presence in the woods;
 A viewless being, that with life and love,
 Informs the reverential solitudes:
 The rich air knows it, and the mossy sod—
 That thou art here, my God!"

CLASS XVIII. POLYADEL'PHIA.

(*Filaments combined in more than two sets.*)

ORDER I.

POLYAN'DRIA. MANY STAMENS.

GENUS I. ANDROSÆ'MUM.—ALL. *Tutsan*.

Nat. Ord. HYPERIC'NEÆ. JUSS.

GEN. CHAR. *Calyx* divided into five unequal pieces. *Petals* five. *Styles* three. *Stamens* numerous, united at the base. *Fruit* a pulpy one called *berry*.—Name from *ωνε*, a *man*; and *αιμα*, *blood*; so called from the juice of the berry colouring the fingers like blood when bruised.

1. *A. offici'nale*, *Allioni*, (Fig. 1178.) *Tutsan*, or *Park leaves*. Stem shrubby, compressed; calyx of five ovate unequal pieces; leaves ovate, sessile.

Lindley, Synopsis, p. 43.—*Hypericum Androsæmum*, Linn.—English Botany, t. 1225.—English Flora, vol. iii. p. 323—Hooker, British Flora, ed. 4. vol. i. p. 281.

An erect branched *shrub*, about two feet high, its branches quadrangular, compressed, smooth, bright brown. *Leaves* opposite, sessile, smooth, spreading, ovate, somewhat heart-shaped, a bright green above, pale and glaucous beneath, with a prominent mid-rib and lateral veins. *Inflorescence* a terminal dichotomous cyme of numerous flowers. *Bractea* leafy. *Calyx* of five pieces, ovate, three of them larger than the others, smooth, pale green. *Corolla* about an inch wide, of five bright yellow ovate spreading petals. *Stamens* numerous, in three sets. *Styles* three, spreading. *Fruit* a purplish black pulpy berry, imperfectly three celled.

Habitat.—Hedges and shrubby places; Walsbam and Dalling, Norfolk; Asteridge, Herts; between Dorking and Guilford, and at Great Marlow, Bucks; not unfrequent in Devonshire and Cornwall; frequent in Ireland and the West of Scotland.



1178 *Androsæmum officinale.*



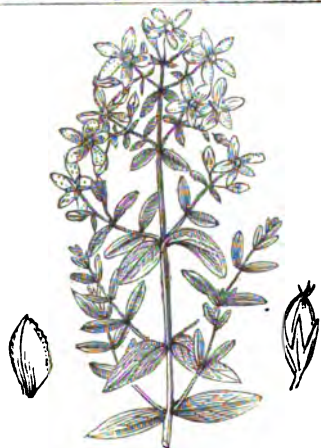
1179 *Hypericum calycinum.*



1180 *Hypericum quadrangulum.*



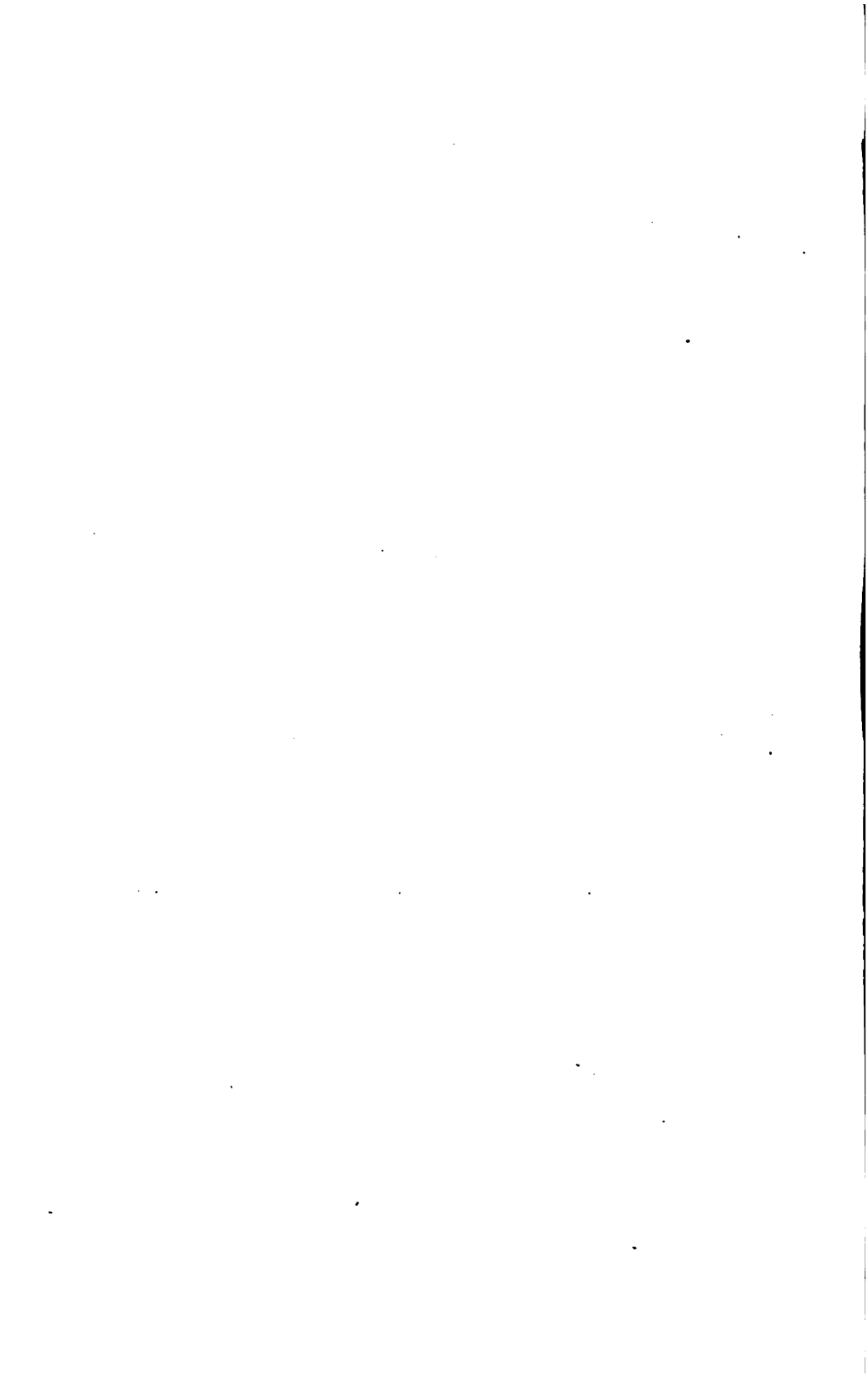
1181 *Hypericum dubium.*



1182 *Hypericum perforatum..*



1183 *Hypericum humifusum.*



Shrub; flowering in July.

The name of Tutsan seems to be derived from the French *Toute-saine*, or all-heal, from the bruised capsules being formed into a kind of poultice, and applied to recent wounds. It is not now so highly esteemed for its healing powers, and is only valued as an ornamental flowering shrub; it flourishes well on the borders of shrubberies or plantations, in a sandy or light soil; its leaves have a pleasant odour when rubbed between the fingers, and its large cymes of flowers are very handsome.

GENUS II. HYPERICUM.—LINN. *St. John's Wort.*

Nat. Ord. HYPERICINÆ. JUSS.

GEN. CHAR. *Calyx* of five pieces, more or less united at the base.

Petals five. *Styles* three to five. *Stamens* numerous, rarely few, united at the base. *Fruit* a membranous three celled capsule.—Name of doubtful meaning.

* *Calyx segments entire at the margin.*

1. *H. calyci'num*, Linn. (Fig. 1179.) *Large flowered St. John's Wort.* *Styles* five; flower solitary; segments of the calyx unequal, obovate, obtuse; stem shrubby, branched, square; leaves oblong.

English Botany, t. 2017.—English Flora, vol. iii. p. 323.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. 41.

Root with creeping underground stems. *Stems* shrubby, erect, about eighteen inches high, square, smooth, branched, leafy. *Leaves* persistent, ovate oblong, about two inches long, smooth, of a leathery texture, paler beneath, nearly sessile. *Inflorescence* a terminal solitary flower, of a bright yellow colour, from two to three inches wide. *Calyx* of five ovate unequal smooth spreading pieces. *Petals* five, ovate oblong, entire, or sometimes lobed. *Stamens* in five sets, the *filaments* long, slender, unequal. *Anthers* small, reddish. *Styles* five, sometimes four. *Capsule* globose, many seeded.

Habitat.—Bushy places; Largs and Balmacarra, Scotland; and near Cork, Ireland; but a doubtful native.

Perennial; flowering from July to September.

This is an extremely pretty plant, growing freely upon banks and borders of bushy places or plantations, where it is partly shaded; its flowers are large, and very handsome, and it continues flowering a long time. It is a common cultivated plant, having, it is probable in the above stations, escaped from gardens, and thus naturalized itself.

2. *H. quadran'gulum*, Linn. (Fig. 1180.) *Square stalked St. John's Wort.* Stem erect, square, herbaceous, somewhat branched; leaves

ovate, scattered over with pellucid dots; calyx segments lanceolate, acuminate, entire; styles three.

English Botany, t. 370.—English Flora, vol. iii. p. 325.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. 42.—*H. tetrapterum*, Fries.

Root fibrous, with woody somewhat creeping underground stems, the whole plant smooth. *Stems* mostly several, erect, acutely four angled, smooth, often pinkish, leafy, about two feet high, mostly much branched with short axillary leafy branches. *Leaves* ovate, pale bright green above, glaucous beneath, and scattered over with small pellucid dots, opposite, sessile, veiny, the margin more or less profusely beset with dark glandular dots, secreting a pink fluid. *Inflorescence* a terminal sub-corymbose panicle of numerous lemon coloured flowers. *Calyx* of five equal entire lanceolate segments, smooth, veiny. *Petals* oblong, oblique, sometimes dotted or striated with dark purple. *Styles* short, erect, three. *Capsules* oblong, smooth, three celled, many seeded.

Habitat.—Moist pastures, meadows, and thickets, by the side of rivulets.

Perennial; flowering in July and August.

Readily distinguished from the following species, by its narrow lanceolate calyx segments and dotted leaves. It is very variable in size, according to the kind of soil in which it has grown; if dry and arid, it is a simple erect unbranched stem, about a foot high. If it has grown in a wet soil it is branched from the axis of every leaf, and is a stout plant, about two feet high; but in its specific character it is constant.

3. *H. du'bium*, Linn. (Fig. 1181.) *Imperforate St. John's Wort*. Stem erect, square, herbaceous, branched; leaves ovate, without pellucid dots; calyx segments elliptic-obtuse, entire; styles three.

English Botany, t. 296.—English Flora, vol. iii. p. 326.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. 42.

Root fibrous. *Stem* erect, round, with two opposite elevated lines, sometimes quadrangular above, smooth, more or less branched, from one to two feet high. *Leaves* numerous, ovate, sessile, glaucous beneath, with an elevated mid-rib and lateral branched veins, without or with very pellucid dots; but on the margin of the leaves and angles of the stem there is a more or less continuous line of dark spots. *Inflorescence* numerous bright yellow flowers, terminating the stem and branches in small paniculated clusters. *Calyx* segments elliptic, ovate, obtuse, entire, striated. *Petals* ovate, acute, spreading, spotted and streaked like the calyx with dark glandular spots. *Stamens* numerous, with slender spreading filaments, and ovate two celled *anthers*. *Styles* three. *Capsules* ovate, acute, many seeded.

Habitat.—Woods and bushy places in hilly or mountainous districts in various places, but not common.

Perennial; flowering in July and August.

1. *H. perforatum*, Linn. (Fig. 1182) *Common perforated St. John's Wort*. Stem erect, two edged, herbaceous, branched; leaves ovate oblong, with pellucid dots; calyx segments lanceolate, acute, entire; styles three.

English Botany, t. 295.—English Flora, vol. iii. p. 325.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. 42.

Root woody, fibrous, with somewhat creeping underground stems. *Stem* erect, about two feet high, round, with two opposite elevated lines, smooth, much branched and leafy. *Leaves* ovate oblong, smooth, sessile, various in size and width, dark green above, paler beneath, and copiously dotted over with small pellucid glandular dots. *Inflorescence* very numerous, bright yellow flowers, terminating the stem, and branched in paniculated clusters. *Calyx* segments narrow, lanceolate, acute. *Petals* ovate, oblique, crenated on one side, entire on the other, spreading, spotted and streaked like the calyx with dark purplish glandular spots. *Stamens* numerous, the filaments slender, spreading, the *anthers* small, ovate. *Styles* three, short. *Capsules* rather large, ovate, acute, three celled, many seeded.

Habitat.—Woods, thickets, hedges, &c.; very common.

Perennial; flowering in July and August.

The size of this species is very variable, according to the soil and situation in which it has grown; but it is readily distinguished in all its varieties by its lanceolate calyx segments and much dotted leaves. It was formerly held in high repute as a valuable remedial plant in the cure of wounds, bruises, &c., and obtained the name in consequence, of the "Balm of the Warrior's Wound." Ancient superstition attributed to this plant the power of defending persons from enchantments, phantoms, and spectres, and still more of being adapted to drive away devils, for which virtue it was called by the old herbalists *Fuga Dæmonum*; and this superstitious feeling is not even now exploded, for it is said that the French and German peasants gather it with much ceremony on St. John's day, a species of credulity apparently of modern adoption.

5. *H. humifusum*, Linn. (Fig. 1183.) *Trailing St. John's Wort*. Stem procumbent, filiform, sub-compressed; leaves ovate oblong, obtuse; calyx segments ovate, obtuse, entire, leafy; styles three.

English Botany, t. 1226.—English Flora, vol. iii. p. 326.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. 42.

Root fibrous, the whole plant smooth, herbaceous. *Stems* numerous, branched, procumbent, spreading, somewhat compressed, two edged, leafy, slender. *Leaves* ovate oblong, obtuse, sessile, a bright green above, pale and glaucous beneath, and veiny, the margin with

more or less numerous black dots. *Inflorescence* a few pale lemon coloured flowers, in terminal and axillary corymbose clusters. *Calyx* segments leafy, large, ovate oblong, obtuse, mostly with a bristle point, the margin often glandulous, mostly dotted, as are the ovate acute petals. *Stamens* numerous. *Styles* three. *Capsules* ovate acute, brownish, pink, three celled, many seeded.

Habitat.—Gravelly, heathy, and boggy pastures, old walls and wet rock; not uncommon.

Perennial; flowering in July.

The leaves of this species are variable in size, as well are those of the calyx, and the margin of the calyx segments have the glands sometimes so large and prominent, as to give a fimbriated appearance. The leaves, as well as the calyx, mostly become pink as they fade and decay.

** *Calyx segments glanduloso-serrated, or fimbriated on the margin.*

6. *H. montanum*, Linn. (Fig. 1184.) *Mountain St. John's Wort*. Stem erect, round, smooth; leaves ovate, heart shaped, sessile, the upper ones with pellucid dots; calyx segments lanceolate, acute, ciliated, with stalked globose glands.

English Botany, t. 371.—English Flora, vol. iii. p. 327.—Hooker, British Flora, ed. 4. vol. i. p. 281.—Lindley, Synopsis, p. —.

Root fibrous. *Stem* round, straight, erect, smooth, leafy below, simple or branched above, about two feet high. *Leaves* ovate, heart-shaped, sessile, and embracing the stem, dark green above, pale beneath, and often downy, the upper leaves profusely dotted over with pellucid glandular dots, the lower ones without dots, but with numerous netted pellucid veins, the margin with a row of dark brown almost black dots, the mid-rib stout, and the lateral ones prominent. *Inflorescence* terminal, of numerous crowded flowers, in terminal panicles, elevated on slender leafless branches. *Bractes* lanceolate, ciliated with stalked globose dark glands, as well as the margin of the lanceolate *calyx* segments. *Corolla* pale lemon colour, petals elliptic ovate, entire, smooth, without spots. *Capsule* elliptic ovate, three celled. *Seeds* minute, very numerous.

Habitat.—Bushy places in hilly districts in a dry soil.

Perennial; flowering in July.

A pretty elegant plant, readily distinguished by its erect round almost branchless stem, its sessile ovate leaves, and beautifully fringed calyx and bractea. Sometimes the stem and under side of the leaves are clothed with soft close pubescence, and the lower part of the stem and margin of the leaves are often of a pinkish colour.

7. *H. barbatum*, Jacq. (Fig. 1185.) *Bearded St. John's Wort*. Stem erect, somewhat angular; leaves oblong lanceolate, with black scattered dots beneath, without pellucid dots; calyx segments lanceolate, ciliated with long stalked glands.



1184 *Hypericum montanum.*



1185 *Hypericum barbatum.*



1186 *Hypericum linearifolium.*



1187 *Hypericum hirsutum.*



1188 *Hypericum pulchrum.*



1189 *Hypericum elodes.*



English Botany, t. 1086.—English Flora, vol. iii. p. 327.—Hooker, British Flora, ed. 4. vol. i. p. 282.—Lindley, Synopsis, p. 42.

Stem erect, about a foot high, straight, simple or branched above, leafy, smooth, round, angular above and at the joints. *Leaves* oblong lanceolate, entire, smooth, the margin somewhat revolute, dark green above, paler beneath, and scattered over with dark almost black dots, the mid-rib stout, and the veins numerous, small. *Inflorescence* terminal, branched, somewhat leafy panicles. *Bracteas* and *calyx* segments streaked and dotted with dark purple, and their margins copiously fringed with long bristles, tipped with a small globose gland. *Corolla* bright yellow, with obovate petals, minutely fringed or toothed, and scattered over with black glandular dots. *Capsules* ovate, covered over with glandular dots. *Seeds* numerous, small.

Habitat.—Side of a hedge near Aberdalgy, in Strathearn, Perth shire.

Perennial; flowering in September and October.

A doubtful native plant; it has very probably been brought from the Continent, where in hilly, bushy places it is not unfrequent. It is nearly allied to *H. Richeri*, Vill., which has, however, the calyx and bracteas fringed with much shorter bristles, and the calyx segments more ovate and obtusely pointed.

8. *H. lineari'folium*, Vahl. (Fig. 1186.) *Linear leaved St. John's Wort*. Stem erect, round; leaves linear, obtuse, the margins with black dots, revolute, without pellucid dots; calyx segments lanceolate, acute, their margins ciliated with stalked glands, and numerously dotted with black dots.

Hooker, British Flora, ed. 4. vol. i. p. 282.—De Cand. Prod. 1. p. 552.

Stems several from the same root, procumbent below, becoming erect, about a foot high, round, smooth, slender, simple. *Leaves* sessile, linear, obtuse, dark green above, pale beneath, with a stout mid-rib, the margin rolled back, with a line of dark dots, but without any of the pellucid ones. *Inflorescence* a sub-corymbose panicle of rather large bright yellow flowers. *Calyx* segments and *bracteas* lanceolate, acute, striated and dotted with black elevated spots, and the margin ciliated with pale bristles, tipped with a dark globose gland. *Corolla* large, of oblong ovate petals, more or less scattered over with black dots, and often toothed or ciliated on the margin towards the point, with glandular serratures. *Styles* three. *Capsules* ovate, many seeded.

Habitat.—On dry slopes of hills in several parts of Jersey, particularly on a hill between Anna Porta and St. Katherine's Bay.—*Babington*.

Perennial; flowering in July and August.

Native specimens of this pretty species we have not seen, but have

described and made the drawing from specimens collected in France. It is very different from any other of our species, and is readily known by its linear revolute leaves and round smooth slender stems.

9. *H. hirsutum*, Linn. (Fig. 1187.) *Hairy St. John's Wort*. Stem erect, round, pubescent; leaves ovate or oblong, on short petioles, scattered over with pellucid dots, and downy beneath; calyx segments lanceolate, the margins ciliated with short stalked glands.

English Botany, t. 1156.—English Flora, vol. iii. p. 328.—Hooker, British Flora, ed. 4. vol. i. p. 282.—Lindley, Synopsis, p. 42.

Root fibrous. *Stems* several, erect, round, about two feet high, simple or branched, clothed with soft pubescence, leafy. *Leaves* ovate or oblong, on a short footstalk, nearly smooth above, downy beneath, with a prominent mid-rib and lateral veins, more or less profusely scattered over with small pellucid dots, and sometimes mixed with dark ones. *Inflorescence* a large terminal many flowered somewhat leafy branched panicle. *Calyx* and *bracteas* lanceolate, acute, finely downy, and the margins fringed with black globose glands, elevated on short stalks. *Corolla* rather large, bright yellow, the *petals* ovate oblong, veiny and fringed towards the point with stalked glands. *Styles* three, spreading. *Capsules* ovate, smooth, three celled, many seeded.

Habitat.—Woods and thickets; not unfrequent, especially in a chalky or sandy soil.

Perennial; flowering in July.

10. *H. pulchrum*, Linn. (Fig. 1188.) *Small upright St. John's Wort*. Stem erect, round, smooth; leaves ovate, heart-shaped, smooth, scattered over with pellucid dots; calyx segments obovate, obtuse, serrated with black sessile glands.

English Botany, t. 1227.—English Flora, vol. iii. p. 329.—Hooker, British Flora, ed. 4. vol. i. p. 282.—Lindley, Synopsis, p. 42.

Root woody, branched. *Stems* mostly several, from one to two feet high, erect, straight, slender, round, smooth, often pinkish, branched with short axillary branches. *Leaves* ovate, heart-shaped, sessile, of a firm rigid texture, a dark somewhat glaucous green above, pale beneath, with a stout mid-rib and slender lateral veins, scattered over with pellucid glandular dots. *Inflorescence* a terminal branched loose somewhat leafy panicle. *Calyx* segments ovate, obtuse, more or less profusely fringed with sessile black globose glands. *Corolla* large for the size of the plant, *petals* ovate oblong, a bright yellow, often stained externally with crimson, the margin towards the point fringed with black sessile glands. *Stamens* with ovate crimson *anthers*. *Capsules* ovate, smooth, many seeded.

Habitat.—Woods and bushy places, heaths and banks; frequent.

Perennial; flowering in July.

The lower leaves of this plant soon fade to a brightish yellow, and

are mostly tinged with crimson, which gives the plant an elegant and gay appearance, combined with the beautiful crimson tipped flowers.

11. *H. elo'des*, Linn. (Fig. 1189.) *Marsh St. John's Wort*. Stem round, ascending, rooting at the base; leaves roundish ovate, sessile, downy, scattered over with pellucid dots; calyx segments ovate, acute, ciliated with short stalked reddish glands; panicle few flowered.

English Botany, t. 109.—English Flora, vol. iii. p. 330.—Hooker, British Flora, ed. 4. vol. i. p. 282.—Lindley's Synopsis, p. 42.

Root long branched fibres from the lower joints of the prostrate or creeping base of the *stem*, becoming erect, and from three to twelve inches long, round, or somewhat angular, clothed with woolly pubescence, branched only at the base, leafy. *Leaves* roundish ovate, sessile, clothed with short soft pubescence, dark green above, pale beneath, and with prominent radiating ribs, more or less profusely dotted over with pellucid dots. *Inflorescences* a small terminal panicle of few yellow flowers. *Calyx* segments ovate, acute, smooth, veiny, fringed with reddish glands, elevated on a short stalk. *Petals* ovate oblong, pale yellow, with greenish ribs. *Stamens* with the filaments in three sets, but divided only about one-third the length. *Styles* three, spreading. *Capsules* ovate, ribbed, often imperfect.

Habitat.—Spongy bogs, especially in mountainous situations.

Perennial; flowering in July and August.

CLASS XIX.

SYNGENE'SIA.

(*Anthers united into a tube. Flowers compound.*)

ORDER I.

POLYGAMIA ÆQUALIS.

FLORETS ALL PERFECT.

GENUS I. HYPOCHÆRIS.—LINN. *Cat's-ear*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* oblong, imbricated. *Receptacle* paleaceous, the scales deciduous. *Fruit* striated, more or less beaked. *Pappus* feathery.—Name from *ὑπο*, for; and *χοῖρος*, a hog; so called from hogs being fond of the roots.

1. *H. gla'bra*, Linn. (Fig. 1190.) *Smooth Cat's-ear*. Stem branched, nearly smooth, and scarcely leafy; root leaves toothed and sinuated;

involucrum oblong, equally imbricated; fruit in the centre, with a long beak, those on the circumference without a beak.

English Botany, t. 575.—English Flora, vol. iii. p. 376.—Hooker, British Flora, ed. 4. vol. i. p. 290.—Lindley, Synopsis, p. 161.

Root tapering. *Stems* numerous, hollow, nearly smooth, simple, or mostly branched, wavy, erect or spreading, from six to twenty inches long, bearing one or two somewhat scaly leaves. *Radical* leaves numerous, oblong, or tongue-shaped, more or less deeply toothed, or slightly sinuated, smooth or hairy, sometimes fringed on the margin. *Flowers* solitary, heads terminating the stem and branches, small, bright yellow. *Involucre* scales lanceolate, smooth, regularly imbricated, a pale glaucous green, tinged with pink. *Receptacle* with lanceolate paleaceous scales, thin, membranous, as long as the fruit, deciduous. *Fruit* slender, finely striated and roughish, the central ones tapering into a long beak, those of the circumference without a beak. *Pappus* feathery.

Habitat—Fields in a light soil in various parts of the country, but nowhere very common.

Annual; flowering in July and August.

This is an extremely variable plant in size and luxuriance, and is smooth or hairy, according as it is grown in dry or moist situations. When the stem is broken, there issues from its ends a bitter tasted milky fluid.

2. *H. radicata*, Linn (Fig. 1191) *Long rooted Cat's-ear*. Stem branched, smooth, and leafless; peduncles with small scales; root leaves obtuse, runcinate, rough; fruit all with long beaks.

English Botany, t. 831.—English Flora, vol. iii. p. 377.—Hooker, British Flora, ed. 4. vol. i. p. 290.—*Achyrophorus radicans*, Scop.—Lindley, Synopsis, p. 161.

Root very long, tapering, and fibrous. *Stems* several, simple or branched, spreading, round, hollow, striated, smooth, or sometimes hairy at the base, leafless, somewhat glaucous at the base of each branch, and scattered upon the peduncle, are small lanceolate scales. *Leaves* all radical, spreading close to the ground, oblong, blunt, runcinate, rough, with rigid hairs, dark green above, pale and glaucous beneath. *Flowers* large solitary heads, terminating the stems and branches. *Involucre* scales lanceolate, purplish, rough on the keel, with rigid bristles, and fringed at the points with soft down. *Florets* bright yellow, spreading, strap-shaped, toothed at the extremity. *Receptacle* with thin membranous awl-shaped scales. *Fruit* angular, striated, rough, all tapering into a beak. *Pappus* feathery.

Habitat.—Meadows, pastures, and road sides; frequent.

Perennial; flowering in July.

3. *H. maculata*, Linn. (Fig. 1192.) *Spotted Cat's-ear*. Stem one to three flowered, nearly leafless, hairy; scales of involucre rough,



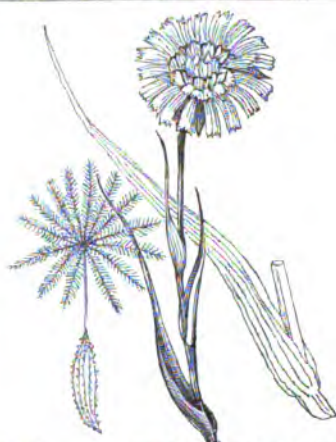
1190 *Hypochaeris glabra.*



1191 *Hypochaeris radicata.*



1192 *Hypochaeris maculata.*



1193 *Tragopogon pratensis.*



1194 *Tragopogon porrifolius.*



1195 *Thrincia hirta.*



with rigid hairs; leaves radical, ovate oblong, scattered over with hairs, entire or toothed on the margin.

English Botany, t. 225.—English Flora, vol. iii. p. 375.—Hooker, British Flora, ed. 4. vol. i. p. 290.—*Achyrophorus maculatus*, Scop.—Lindley, Synopsis, p. 161.

Root long, thick, tapering, fleshy, and with slender fibres, very milky. *Stem* round, rough, simple, or sometimes slightly branched, erect, solitary, bearing one or two scale-like leaves. *Leaves* radical, spreading on the surface of the ground, ovate oblong, entire, or unequally and grossly toothed on the margin, dark green above, and mostly scattered over with unequal sized brown spots, pale and somewhat glaucous beneath. *Flowers* large, deep yellow. *Florets* strap-shaped, toothed at the extremity. *Segments* of the *involucre* narrow lanceolate, entire on the margin, rough on the back, with rigid bristles, and the intermediate ones downy towards the point. *Fruit* all taper-pointed.

Habitat.—Limestone and chalky pastures; not unfrequent in England; Ormshead, North Wales; dry woods, east of Forfar, Scotland.

Perennial; flowering in July.

GENUS II. TRAGOPOGON.—LINN. *Goat's-beard*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* simple, of from eight to twelve leafy scales, united at the base. *Receptacle* naked. *Fruit* longitudinally striated and beaked. *Pappus* feathery.—Name from *tragos*, a goat; and *payon*, a beard; so called from the beautiful bearded fruit.

1. *T. pratensis*, Linn. (Fig. 1193.) *Yellow Goat's-beard*. Peduncles cylindrical, slightly thickened beneath the flower; involucre segments about as long as the florets; leaves channeled, with a long slender tapering point; fruit striated and tuberculated, as long as the slender tapering beak.

English Botany, t. 434.—English Flora, vol. iii. p. 337.—Hooker, British Flora, ed. 4. vol. i. p. 289.—Lindley, Synopsis, p. 161.

Root long, tapering, fleshy, the whole plant smooth, of a pale glaucous hue, abounding with milky juice. *Stems* mostly several, erect, round, simple or branched, from one to two feet high, leafy, striated. *Leaves* ovate at the base, with a long slender tapering point, the margin mostly somewhat wavy at the base, the radical ones numerous, alternate on the stem. *Flowers* terminal, solitary, rather large, yellow, expanding on fine days early in the morning, and closing before noon. *Florets* strap-shaped, half an inch long, toothed at the apex. *Involucre* segments smooth lanceolate, taper-

pointed, as long or rather longer than the florets. *Fruit* when ripe and expanded a large handsome elegant feathery ball, the seed linear, curved, striated and rough, with elevated tubercles, light brown, tapering into a slender awn as long as itself, and crowned by its elegant ring of long slender branches of feathery *pappus*.

Habitat.—Meadows and pastures.

Biennial; flowering in June.

The cylindrical peduncles readily distinguish this from the other species; sometimes specimens are found with the peduncles somewhat thickened beneath the flower, and the calyx segments rather longer than the florets: it is then the *T. major*, Jacq. The leaves are also sometimes waved on the margin, contorted, in which state it is the *T. undulatum*, Jacq., *T. revolutus*, Schw. From the remarkable circumstance of the flowers closing at or before noon, however fine and cloudless the day may be, it has obtained the name amongst the country people of *Jack go to Bed at Noon*.

2. *T. porrifolius*, Linn. (Fig. 1194) *Purple Goat's-beard*, or *Salsafy*. Peduncles swollen upwards in a club-shaped manner; involucre segments longer than the florets; leaves channeled, with a long straight slender tapering point; fruit striated and tuberculated on the margins, shorter than the slender tapering beak.

English Botany, t. 638.—English Flora, vol. iii. p. 338.—Hooker, British Flora, ed. 4. vol. i. p. 288.

Root long, tapering, fleshy, abounding in a milky juice, the whole plant smooth, of a glaucous green. *Stem* erect, branched, from three to four feet high. *Leaves* dilated at the base, erect, with a long slender tapering point, channeled, ribbed. *Peduncles* long, dilated beneath the flower into a club-shaped form, and hollow. *Flowers* terminal, a deep dull purple, expanding early in the morning, and closing before noon. *Involucre* segments about eight, narrow lanceolate, smooth, much longer than the florets. *Florets* strap-shaped, obtuse, and toothed at the end. *Anthers* dark purple. *Fruit* oblong, tapering at each end, curved, striated, and rough, with tuberculated points, shorter than its long slender tapering beak, which is crowned with a whorl of long slender feathery branched *pappus*.

Habitat.—Moist meadows and banks of rivers in various parts of England; about Glasgow, Scotland.

Perennial; flowering in May and June.

This is a doubtful native species, having probably become naturalized by its escape from gardens, where it was formerly much cultivated for its long fleshy roots, which were highly valued as a culinary vegetable. They have a mild sweet flavour, somewhat resembling asparagus, and used also as carrots or turnips. *T. pratensis* was also cultivated for the same purpose, though they are now seldom or never found in English gardens; but in France, Germany, and

especially in Italy, they are still esteemed, and cultivated mostly as an ingredient to flavour soups.

GENUS III. THRIN'CIA.—ROTH. *Thrinicia*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involuorum* imbricated. *Receptacle* naked. *Fruit* gradually tapering into a beak. *Pappus* of the marginal florets short, scaly, cupped, of those of the disk short, feathery, unequal. Name from *Σειχος*, a *feather*; in allusion to the feathery pappus.

1. *T. hir'ta*, Roth. (Fig. 1195.) *Hairy Thrinicia*. Leaves lanceolate, somewhat toothed or sinuated, and bristly, with frequently forked hairs; scape single flowered, ascending, smooth, as well as the involucre; fruit with a tapering beak; root abrupt, with long fibres.

Hooker, British Flora, ed. 4. vol. i. p. 289.—Lindley, Synopsis, p. 162.—*Hedypnois hirtum*.—English Botany, t. 555.—*Apargia hirta*, Hoffm.—English Flora, vol. iii. p. 352.—*Leontodum hirtum*, Linn.

Root fleshy, abrupt, with numerous long slender fibres. *Leaves* lanceolate, dark green above, paler beneath, roughish, with rigid bristly hairs, which are often forked, the margin entire, or slightly toothed or sinuated in a runcinate manner. *Flower* solitary, on an erect slender scape, about five inches long, round, smooth, or slightly hairy. *Involuorum* imbricated, with lanceolate smooth segments. *Florets* deep yellow, strap-shaped, obtuse at the end, and finely toothed. *Fruit* oblong, curved, striated, and rough, the outer ones with scaly toothed pappus, those of the disk with feathery pappus, each of the rays dilated at the base.

Habitat.—Gravelly pastures, heaths, and moors; frequent.

Perennial; flowering in July and August.

GENUS IV. PICRIS.—LINN. *Picris*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involuorum* imbricated, of numerous equal erect scales, and several small linear scattered ones. *Receptacle* naked. *Fruit* gradually tapering into a point, transversely striated. *Pappus* deciduous, united into a ring at the base, the outer of a few hairs, the inner feathery.—Name *πικρος*, *bitter*; in allusion to the bitterness of many of the species.

1. *P. hieracioides*, Linn. (Fig. 1196.) *Hawkweed Picris*. Hispid leaves oblong lanceolate, toothed or sinuated, those of the stem sessile, sub-amplexicaul; flowers corymbose; peduncles with several

bracteas; outer scales of the involucre spreading; fruit constricted below the pappus.

English Botany, t. 196.—English Flora, vol. iii. p. 339.—Hooker, British Flora, ed. 4. vol. i. p. 289.—Lindley, Synopsis, p. 158.

Root tapering, and with branched fibres, the whole plant is of a dark green, rough, with rigid pubescence. *Stem* round, and somewhat furrowed, solid, more or less branched, leafy, especially below, from two to three feet high. *Leaves* oblong lanceolate, the lower ones from three to six inches long, tapering at the base into a long footstalk, the upper leaves abrupt at the base, sessile, and clasping the stem. *Inflorescence* numerous heads, disposed in a sub-corymbose manner. *Involucre* scales lanceolate, downy, the outer ones small, loosely spreading, and scattered on the pedicles, the inner ones larger, erect, and often with rigid forked bristles at the back. *Flowers* about an inch wide, bright yellow. *Corolla* strap-shaped, obtuse at the end, and finely toothed. *Fruit* oblong, brown, constricted beneath the pappus into an obtuse point, longitudinally striated, and transversely wrinkled with fine waved lines. *Pappus* united into a ring at the base, formed of simple hair-like and feathery rays.

Habitat.—Banks, road sides, and stony places; frequent.

Biennial; flowering in July and August.

GENUS V. APARGIA.—SCHREB. *Hawkbit*.

Nat. Ord. COMPOSITÆ. Juss.

GEN. CHAR. *Involucre* imbricated, of numerous hairy black scales. *Receptacle* naked. *Fruit* pointed, smooth. *Pappus* feathery.—Name of uncertain origin.

1. *A. hispidula*, Willd. (Fig. 1197.) *Rough Hawkbit*. *Root* abrupt; scape single flowered, naked, or with one or two scales; leaves oblong, lanceolate, tapering into a footstalk, toothed or pinnatifid, smooth or rough, with forked hairs; rays of the pappus dilated at the base; fruit striated, smooth.

English Flora, vol. iii. p. 351.—Hooker, British Flora, ed. 4. vol. i. p. 289.—Lindley, Synopsis, p. 18.—*Hedynois hispidum*, Huds.—English Botany, t. 554.—*Leontodon*, Linn.—*L. hastilis*, *a. vulgaris*. Koch.—*Hieracium incanum*, Poll.

Root abrupt, and with numerous long branched fibres. *Leaves* all radical, numerous, oblong lanceolate, tapering into a footstalk, dark green above, paler beneath, and rough, with rigid branched bristly hairs, rarely simple, more or less toothed, unequally and often divided into oblong lobes in a pinnatifid manner. *Scape* erect, solitary, or several, round, striated, hairy, hollow, terminated in a solitary head,



1196

Picris hieracioides.



1197

Apargia hispida.



1198

Apargia autumnalis.



1199

Leontodon taraxacum.



1200

Helminthia echioides.



1201

Lactuca virosa.

drooping in the bud, and sometimes bearing one or two bracteated scales. *Involucre* of numerous linear scales, the outer ones small and spreading, the inner erect, all almost black, downy and rough, with white rigid bristles. *Flowers* bright yellow, about an inch and half across. *Florals* strap-shaped, obtuse at the end, and finely toothed. *Fruit* linear, gradually tapering upwards. *Pappus* persistent, of numerous equal feathery rays, dilated at the base, sometimes there are a few short rays mixed with the longer ones.

Habitat.—Meadows and pastures; frequent.

Perennial; flowering in July.

2. *A. autumnalis*, Willd. (Fig. 1198.) *Autumnal Hawkbit*. Root abrupt; stem branched, many flowered; peduncles scaly, thickened upwards; involucre scales downy; leaves lanceolate, pinnatifid or toothed, smooth or hairy; fruit striated and rough; rays of the pappus dilated at the base.

English Flora, vol. iii. p. 353.—Hooker, British Flora, ed. 4. vol. i. p. 289.—*Oporina*, Don.—Lindley, Synopsis, p. 162.—*Hedypnois*, Hudson.—English Botany, t. 830.—*Leontodon autumnalis*, Linn.

β. pratensis. Involucre and upper part of the peduncles clothed with blackish hairs.

Hedypnois Taraxici, Linn.—English Botany, t. 1109.—*Apargia Tarax.* Willd.—Smith, Hooker.—*A. pratensis*, Link.

Root abrupt, with long slender branched fibres. *Leaves* all radical, spreading, lanceolate, tapering into a footstalk, toothed, or deeply lobed in a pinnatifid manner, dark green above, pale beneath, with a prominent mid-rib, smooth or rough, with rigid hairs. *Stem* ascending, single or several, from twelve to eighteen inches high, round, simple, or mostly waved and branched above, smooth below, more or less hairy above. *Peduncles* more or less swollen upwards, and scattered over with small lanceolate bracteas. *Flowers* solitary, about an inch across, deep yellow. *Involucre* imbricated, of linear lanceolate scales, downy, small, and scattered externally, the inner ones longer, erect. *Florals* linear, obtuse, finely toothed at the end. *Fruit* linear, tapering upwards, finely striated, and rough, with elevated points, crowned with a ring of *pappus*, formed of slender rays, dilated at the base.

Habitat.—Meadows and pastures; frequent.

Perennial; flowering in August.

This is a variable plant in size, and with more or less deeply toothed or pinnatifid cut leaves. It is found common on the forest as well as on rich meadow land, and in the plain as on the mountain. The variety *β.* is found on the mountains of Wales and Scotland, and has its leaves deeply cut.

GENUS VI. LEONTO'DON.—LINN. *Dandelion*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrium* imbricated, the outer scales frequently lax and flaccid. *Receptacle* naked. *Fruit* with a very long slender beak. *Pappus* feathery, persistent, hairy.—Name from *yeor*, a lion; and *odon*, a tooth; in reference to the tooth-like division of the leaves.

1. *L. Taraxacum*, Linn. (Fig. 1199.) *Common Dandelion*. Fruit linear, obovate, striated, and rough, with elevated points; leaves smooth, oblong, or linear lanceolate, pinnatifido-runcinatus, and toothed or simply toothed; involucre with the outer scales reflexed.

English Botany, t. 510.—English Flora, vol. iii. p. 349.—Hooker, British Flora, ed. 4. vol. i. p. 292.—Lindley, Synopsis, p. 157.—*Taraxacum*, Juss.

β. palustris. Involucre with the outer scales, erect, appressed.

L. palustris.—English Botany, t. 553.—English Flora, vol. iii. p. 350.—Lindley, Synopsis, p. 157.

Root long, tapering, fleshy, abounding in a milky juice. *Leaves* all radical, numerous, spreading, smooth and shining, oblong, or linear lanceolate, tapering into a footstalk, unequally divided into deep toothed lobes, pointing downwards, or divided into simple lobes in a pinnatifid manner. *Scapes* single, or several, cylindrical, smooth, hollow, naked, brittle, as long or longer than the leaves, erect. *Flowers* solitary, about two inches across, a bright yellow, the outer ones often crimson externally. *Involucre* of linear oblong scales, the outer ones smallest, erect, or reflexed, smooth, often wavy. *Florets* linear, obtuse, finely toothed at the end. *Fruit* linear, obovate, the apex abruptly contracted, and tapering into a long slender awn, sub-compressed, striated, the outer stria above scaly, and below rough, with elevated points. *Pappus* fine, feathery, spreading.

Habitat.—Meadows and pasture, &c.; very common. *β.* wet meadows and pastures.

Perennial; flowering all the summer.

The word Dandelion appears to be a corruption of the French *Dent-de-lion*. The young spring leaves of the Dandelion are gathered in Italy and France, and used as a salad; but unless they are gathered very young, they are bitter and tough. They are in those countries, as well as in other parts of the Continent, cultivated and blanched in the spring for salad, and the long fleshy roots are used as a culinary vegetable, cooked in the same manner as the Salsafy and Scorzonera. The roots are also dried and prepared as a substitute for coffee, and seem equally as good for that purpose as those of chicory. As a medicine the roots have been long used, either made into an infusion, or formed into an extract, which has sometimes

been found useful in hepatic affections. It is a mild tonic, and acts considerably upon the secretions, hence its value in affections of the kidneys. From these properties also will be learned its value as an agricultural plant in all pasture lands, provoking to action the digestive organs of the cattle feeding upon it, carrying from the system superfluous fluids, and stimulating the secretion and improving the quality of the milk of cows. Few persons who have spent their youthful days in the country, are ignorant of the leading medicinal qualities of this flower. Howitt, noticing it, says—

“Dandelion, with globe of down,
The schoolboy's clock in every town,
Which the truant puffs amain,
To conjure lost hours back again.”

This hairy globe of down is, however, supposed to possess other powers to the youth, who has passed his school day hours and entered upon the poetic path of love; then each feathered sphere becomes, in the language of flowers, the “Rustic Oracle;” and each little feather, charged with a tender thought, conveys its secret message to the dear one's feet, when carefully blown on its aerial voyage in the direction in which she dwells.

The flowers expand when the sun rises, and close again as it disappears, as if

“She, enamoured of the sun,
At his departure hangs her head and weeps,
And shrouds her sweetness up, and keeps
Sad vigils, like a cloistered nun,
Till his reviving ray appears,
Waking her beauty as he dries her tears.”

Moore.

GENUS VII. HELMINTH'IA.—Juss. *Ox-tongue*.

Nat. Ord. COMPOSITÆ. Juss.

GEN. CHAR. *Involucrum* double, the inner of eight equal scales, the outer of four or five lax leafy ones. *Receptacle* naked. *Fruit* transversely striated, its beak long, capillary. *Pappus* feathery, persistent.—Name *ἑλμινς*, *ἑλμινθος*, a worm; and *θήκη*, a case; so called in allusion to the form of the fruit.

1. *H. echinoides*, Gærtn. (Fig. 1200.) *Bristly Ox-tongue*. Exterior segments of *involucrum* ovato-cordate, with an acuminate point.

Hooker, British Flora, ed. 4. vol. i. p. 289.—Lindley, Synopsis, p. 158.—*Picris echinoides*, Linn.—English Botany, t. 972.—English Flora, vol. iii. p. 339.

Root tapering. *Herb* a bright green, shining, rough, with rigid pungent bristles, arising from a callous base. *Stem* erect, simple or

branched, round, furrowed, leafy, solid, from one to three feet high, abounding, as is the whole plant, with a milky very bitter juice. *Leaves* lanceolate, the lower ones tapering into a slender footstalk, the upper ones sessile, cordate at the base, clasping the stem, all more or less toothed. *Flowers* several, each terminating the stem and branches, about an inch broad, bright yellow. *Involucres* rough, ciliated with pungent bristles, the outer of five, sometimes four, loose spreading heart-shaped leafy segments, the inner of eight linear lanceolate ones, erect. *Florets* linear, obtuse, toothed at the end. *Fruit* oblong, acute, pale brown, beautifully transversely striated with fine wavy lines, the apex tapered into a slender awn, as long or longer than the fruit, and crowned by a persistent ring, on fine slender feathery *pappus*.

Habitat.—Borders of fields, especially in a clayey soil in various parts of England, and about Dublin, not found in Scotland.

Perennial; flowering in June and July.

This is not an uncommon plant in various parts of Italy, but it is far less rough than the plants grown in England, indeed it is sometimes almost smooth, but in other respects it is the same.

GENUS VIII. LACTUCA.—LINN. *Lettuce*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* cylindrical, imbricated, the scales membranous on the margin. *Receptacle* naked. *Flowers* few. *Fruit* compressed, terminating in a long slender beak. *Pappus* hairy, soft, fugacious.—Name from *Lac*, milk; so called in allusion to the milky juice with which most of the species abound.

1. *L. virosa*, Linn. (Fig. 1201.) *Strong-scented Lettuce*. Leaves spreading, oblong, ovate, toothed, eared at the base, and embracing the stem, the mid-rib keeled, and rough, with prickles; flowers panicle; fruit compressed, each side five ribbed, terminating in a white beak as long as itself.

English Botany, t. 1957.—English Flora, vol. iii. p. 345.—Hooker, British Flora, ed. 4. vol. i. p. 290.—Lindley, Synopsis, p. 156.

Root tapering. *Stem* solitary, erect, scarcely branched, and with few leaves smooth above, more or less prickly below. *Leaves* oblong, ovate, a dark glaucous green, the radical ones numerous, finely toothed, those of the stem sessile, two eared at the base, and embracing the stem, often lobed, or sinuated and finely toothed, all with the mid-rib prominent, and keeled on the under side, and rough, with prickles. *Inflorescence* a terminal panicle, of numerous flowers. *Bractææ* heart-shaped, somewhat taper pointed. *Involucres* cylin-

drical, of numerous linear imbricated scales, the outer ones small, lax, the inner equal, erect. *Florets* few, bright yellow, linear, obtuse, toothed at the end. *Fruit* ovate, compressed, on each side are five lines, the apex smooth, terminating in a beak as long as itself. *Pappus* fine white shining rough hairs.

Habitat.—Banks and road sides in a chalky soil, not uncommon; rare in Scotland, about Edinburgh, Dunkeld, Coldstream, Melrose, and Stirling Castle.

Biennial; flowering in August.

Almost all the species of this genus abound with a bitter milky juice, but when the plants are young, or the leaves grown excluded from the light, the slight bitterness is by no means unpleasant, and in this state they are used as a pleasant salad; but the juice which exudes from the wounded leaves and stems of old plants is intensely bitter, and possesses sedative properties. From these plants the juice is collected, and when dried, has a brown colour, of much the same odour as opium, and is known by the name of *Lactucarium*. In this state it has been found a useful medicine in the form of pills, in the dose of from one to six grains, in allaying coughs, and procuring sleep in various affections of the chest, &c. Its action upon the nervous system is less felt after its use than that of opium. In Italy, an infusion of, or water distilled from its leaves and stems, is much used to allay nervous irritations of the system, in fevers, inflammations, &c. In some of the species of *Lactuca*, as *L. virosa*, *elongata*, and *scariola*, the juice is much more narcotic than that of the commonly cultivated species, *L. sativa*, *crisp*, and *quercina*.

The cultivation of the Lettuce is familiar to every lover of a garden; and by sowing a bed every month a regular supply all the year round may be obtained for the table.

2. *L. Scariola*, Linn. (Fig. 1202.) *Prickly Lettuce*. Leaves nearly erect, ovate oblong, acute, eared at the base, sinuated, and ciliato dentate, the mid-rib keeled, and rough, with prickles; panicle leafy; fruit compressed, each side five ribbed, terminating in a white beak as long as itself.

English Botany, t. 268.—English Flora, vol. iii. p. 345.—Hooker, British Flora, ed. 4. vol. i. p. 290.—Lindley, Synopsis, p. 156.

Root tapering. *Stem* solitary, erect, round, smooth, leafy, from two to three feet high. *Leaves* oblong, ovate, acute at the point, a glaucous green, smooth, the radical ones with a footstalk, the upper ones sessile, with an auricle on each side, all nearly erect, not spreading, as in the last species, and variously sinuated in a pin-natifid or runcinate manner, and copiously toothed on the margin with bristle-like teeth, the mid-rib on the under side acutely keeled and rough, with prickles. *Inflorescence* similar to the last, the *fruit*

compressed, five ribbed on each side, and terminating in a beak, white, and as long as itself.

Habitat.—Waste ground near Denny Abbey, Cambridgeshire; Southend, Sussex.

Perennial; flowering in August.

3. *L. saligna*, Linn. (Fig. 1203.) *Least Lettuce*. Leaves linear, entire, eared at the base, the radical ones lanceolate, scarcely toothed, the mid-rib keeled, and scarcely rough, with spines; panicle of straight racemose spicate branches, leafy; fruit compressed, each side five ribbed, terminated with a long white slender beak.

English Botany, t. 707.—English Flora, vol. iii. p. 346.—Hooker, British Flora, ed. 4. vol. i. p. 290.—Lindley, Synopsis, p. 432.

Root tapering, the whole plant slender, wand-like. *Stem* erect, round, smooth, pale brown, or whitish, leafy, simple, or with slender straight branches. *Leaves* smooth, glaucous, green, the mid-rib somewhat prickly, the lower leaves long, narrow, linear, with linear lobes, the upper ones entire, linear, two lobed at the base, sessile, and clasping the stem. *Inflorescence* sub-spicate racemes. *Flowers* small, yellow. *Florets* few, linear, obtuse. *Involucre* of numerous linear smooth glaucous scales, of unequal lengths, erect, close pressed. *Bracteas* small, leafy. *Fruit* ovate, acute, compressed on both sides, five ribbed, roughish, terminated in a long slender white awn, *pappus* slender, rough, silky hairs.

Habitat.—Chalky waste ground, and salt marshes in the South-east of England.

Biennial; flowering in August.

4. *L. murellis*, Less. (Fig. 1204.) *Ivy-leaved Lettuce*. Leaves petiolated, lyrato-pinnatifid, the lobes ovate, angular, toothed, the terminal one large; panicle with spreading branches; florets five in each head.

Hooker, British Flora, ed. 4. vol. i. p. 290.—Lindley, Synopsis, p. 157.—*Prenanthes muralis*, Linn.—English Botany, t. 457.—English Flora, vol. iii. p. 348.

Root long branched fibres, the whole plant smooth and shining, very brittle, and abounding in a milky juice. *Stem* erect, slender, from one to two feet high, round, hollow, leafy, simple, auriculated at the base, and clasping the stem, rarely branched. *Leaves* spreading, the lower ones on longish footstalks, lobed and toothed, the lateral lobes ovate, the terminal one large, triangular, lobed, and toothed, the upper ones mostly with only a terminal lobe, all pale glaucous green beneath, and more or less of a purple tint. *Inflorescence* a slender branched spreading panicle. *Bracteas* small, ovate lanceolate. *Flowers* small, slender, erect. *Involucre* purplish, the outer scales small, the inner long, linear, obtuse. *Florets* pale yellow, five in each head. *Fruit* ovate, acute, compressed, striated, and rough,



1202

Lactuca scariola.



1203

Lactuca saligna.



1204

Lactuca muralis.



1205

Sonchus alpinus.



1206

Sonchus palustris.



1207

Sonchus arvensis.



with elevated points. *Pappus* soft, slender, silky, elevated on a short awn.

Habitat.—Roots of trees, woods, and on old walls.

Perennial; flowering in July and August.

This is a pretty elegant looking plant, growing upon the ruins of old buildings, walls, &c. On account of its having only five florets in a head, it is made into a separate genus, *Phanizopus*, Cassin, but that does not appear a sufficiently important character to separate it from *Lactuca*.

GENUS IX. SON'CHUS.—LINN. *Sow-thistle*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* oblong, imbricated, with two rows of unequal scales. *Receptacle* naked. *Fruit* compressed, the apex truncated. *Pappus* short, hairy.—Named by the Greeks *σῶχος*, from *σῶφος*, *soft*, in allusion to the soft nature of the stem.

1. *S. alpinus*, Linn. (Fig. 1205.) *Blue Alpine Sow-thistle*. Inflorescence racemose, glanduloso-hispid; leaves lyrate, the terminal lobe large, triangular, toothed, the point long, acuminate, the petiole winged, lobed at the base, and embracing the stem, smooth, as is the lower part of the stem; fruit linear, oblong, numerous striated.

Hooker, British Flora, ed. 4. vol. i. p. 292.—Lindley, Synopsis, p. 156.—*S. cæruleus*, Smith.—English Botany, t. 2425.—English Flora, vol. iii. p. 241.

Root "tuberous, woody, slightly creeping." *Stem* erect, about three feet high, round, hollow, leafy, simple, smooth below, rough and viscid, with glandular tipped hairs, of a reddish colour above. *Leaves* smooth, bright green above, pale and glaucous beneath, the lower ones large, lyrate, the terminal lobe triangular, heart-shaped, toothed, the point long, tapering, the lateral lobes oblong, acute, the petiole winged, the base lobed, and clasping the stem, one or two of the upper floral leaves entire, lanceolate. *Inflorescence* racemose, of numerous loose *flowers*, of a fine blue colour, each on an erect pedicle, with several awl-shaped *bracteas*. *Involucre* more or less clothed with glandular hairs, the outer ones small, lanceolate, the inner linear, obtuse, hairy at the point. *Florets* linear, obtuse, cut into slender teeth at the end. *Fruit* linear, oblong, compressed, numerous striated. *Pappus* rough.

Habitat.—Rocky places near rivulets; Highlands of Scotland, Loch-na-gar and Clove Mountains, Glen Dole and Glen Isla.

Perennial; flowering in July and August.

This beautiful species of *Sonchus* is found on most of the high mountains of Europe, from those of Lapland to the Alps of Switzerland.

2. *S. palustris*, Linn. (Fig. 1206.) *Tall Marsh Sow-thistle*. Stem above corymbose, and with the involucre clothed with glandular hairs; leaves runcinato-pinnatifid and toothed, all the segments lanceolate, acuminate, the base arrow-shaped, upper leaves entire; fruit striated, and rough.

English Botany, t. 935.—English Flora, vol. iii. p. 341.—Hooker, British Flora, ed. 4. vol. i. p. 292.—Lindley, Synopsis, p. 156.

Root fleshy, with long spreading branches. *Stem* erect, hollow, angular, and somewhat furrowed, leafy, from six to eight feet high, simple below, branched above. *Leaves* large, smooth, veiny, the margin copiously fringed with bristly teeth, runcinato-pinnatifid, the lobes all narrow, lanceolate, acuminate, mostly pointed downwards, all arrow-shaped at the base, the upper ones lanceolate, arrow-shaped. *Inflorescence* mostly of numerous flowers, in a terminal sub-corymbose panicle, the peduncles and involucre more or less profusely clothed with glandular tipped hairs. *Involucre* erect, the outer scales short, the inner long, linear lanceolate. *Florets* linear, obtuse, finely toothed at the apex. *Fruit* oblong, striated, the stria transversely rugulose.

Habitat.—Marshy places; rare. Isle of Ely, Greenwich, and Blackwall; Croydon, Wouldham, Kent.

Perennial; flowering in July and August.

The Marsh Sow-thistle is the largest of our species, and, indeed, is one of our largest herbaceous plants. It is found more frequent on the Continent than with us, but does not appear to have been applied to any useful purpose. The *S. tenerrimus* is a common plant on ruins and old walls in Italy, and in some parts of the country is used as a spring salad.

3. *S. arvensis*, Linn. (Fig. 1207.) *Corn Sow-thistle*. Stem above corymbose, and with the involucre clothed with glandular hairs; leaves lanceolate, runcinate, cordate at the base, the upper ones entire; fruit striated, and rough.

English Botany, t. 674.—English Flora, vol. iii. p. 342.—Hooker, British Flora, ed. 4. vol. i. p. 292.—Lindley, Synopsis, p. 156.

Root fleshy, creeping. *Stem* erect, from three to four feet high, leafy, round, hollow, but little branched, smooth below, rough at the top, with black glandular hairs. *Leaves* lanceolate, runcinate, finely toothed, smooth, shining, green above, pale and glaucous beneath, the lower leaves tapering into long footstalks, the upper heart-shaped at the base, and clasping the stem, the uppermost ones lanceolate, entire. *Inflorescence* cymose, of numerous large spreading flowers, the peduncles slender, mostly very hairy. *Bracteas* linear, lanceolate, smooth. *Involucre* with the outer scales small, spreading, the inner linear, with a membranous margin, nearly smooth. *Florets* bright yellow, linear, obtuse, finely toothed at the end. *Fruit* ovate, com-



1206

Sonchus oleraceus.



1209

Sonchus oleraceus var. asper



1210

Barkhausia festida.



1211

Crepis virens.



1212

Crepis biennis.



1213

Crepis pulchra.

pressed, striated, and rough, with elevated points. *Pappus* smooth, few, white, silky.

Habitat.—Corn fields; very frequent.

Perennial; flowering in August.

4. *S. oleraceus*, Linn. (Fig. 1208.) *Common Sow-thistle*. Stem branched, the branches sub-umbellated; involucre smooth; leaves ovate oblong, runcinato-pinnatifid, and entire, the lower ones tapered into a more or less contracted footstalk, the upper ones sessile, with acute or rounded auricles at the base; fruit ovate, compressed, three ribbed on each side, transversely rugulose, and the ribs more or less toothed.

English Botany, t. 843.—English Flora, vol. iii. p. 343.—Hooker, British Flora, ed. 4. vol. i. p. 292.—Lindley, Synopsis, p. 156.

β. *asper*. (Fig. 1209). Leaves with rounded auricles, the lower ones sessile, or with a winged footstalk; fruit smooth, the ribs nearly smooth, the marginal ones only distinctly toothed.

Hooker, British Flora, ed. 4. vol. i. p. 292.

S. asper, Hoffm. English Botany, Suppl. t. 2765 and 2766.

Root tapering. *Stem* erect, branched, smooth, round, or angular leafy, very brittle. *Leaves* ovate oblong, runcinato-pinnatifid, or entire, smooth, shining, green above, pale and glaucous beneath, the margin more or less toothed with sharp bristly teeth, the lower leaves tapering into a broad footstalk, more or less winged, the upper ones sessile, with an auricled lobe on each side, embracing the stem, which are oblong, acute, or more or less rounded. *Inflorescence* numerous, rather small flowers, terminating the stem and branches in a sub-umbellate or cymose manner, the peduncles and pedicles more or less clothed with glandular tipped hairs, often smooth, and sometimes with a tuft of cottony down beneath the involucre. *Bracteas* lanceolate, smooth. *Involucre* smooth, the outer segments small, lanceolate, the inner linear, erect. *Florets* linear, obtuse, finely toothed at the end. *Fruit* oblong, ovate, compressed, each side three ribbed, and smooth, or transversely wrinkled, or the ribs are rough, with elevated points more or less conspicuous. *Pappus* white, silky, roughish.

Habitat.—Waste places and cultivated grounds; very common.

Annual; flowering from July to September.

Few plants vary more than this in its size and appearance, according to the place of its growth, as to the soil and situation. Its leaves are as described above, larger or smaller; the lower ones either with a distinct footstalk, or winged to the bottom, the upper ones are sessile, and with large rounded auricles at the base, or they are small and acutely pointed. The fruit is also equally as variable. We have specimens having the rounded auricles with the fruit smooth, and transversely rugulose, and we have others with the fruit smooth; but the ribs very rough, with elevated points. This difference in the

fruit is also found in those varieties of plants having the outer auricles, so that we fear these characters for specific differences must be abandoned.

The whole plant abounds more or less profusely with a milky juice; *S. oleraceus* and *S. arvensis*, furnish rabbits and hares with a favourite food, as well as pigs and asses.

GENUS X. BARKHAUSIA.—MÖENCH. *Barkhausia*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* oval, with deciduous awl-shaped scales, ribbed and furrowed when in fruit, the outer ones lax. *Receptacle* naked. *Fruit* striated, tapering into a long slender beak. *Pappus* hairy.—Name in honour of *Moritz Barkhausia*, a German Botanist.

1. *B. fetida*, *De Cand.* (Fig. 1210.) *Stinking Barkhausia*. Stem erect, leafy; leaves rough, sessile, runcinato-pinnatifid, the upper ones lanceolate, deeply cut at the base; stem hairy; involucre downy, and more or less viscid.

Hooker, British Flora, ed. 4. vol. i. p. 293.—Lindley, Synopsis, p. 158.—*Crepis fetida*, Linn.—English Botany, t. 416.—English Flora, vol. iii. p. 372.

Root tapering, the whole plant more or less hairy, pale green, abounding with milky juice, with the odour of bitter almonds. *Stems* several, spreading, becoming erect, round, solid, branched and leafy. *Leaves* very unequally runcinato-pinnatifid, the radical ones much divided, the footstalk winged to the base, the terminal lobe more or less triangular, larger than the other lobes, the upper leaves lanceolate, cut at the base. *Inflorescence* solitary flowers, terminating the stem and branches. *Peduncles* swollen upwards, furrowed, scattered over with a few ovate lanceolate bractæas, rough, with pubescence. *Involucre* downy, the outer scales awl-shaped, loose, spreading, becoming hardened and furrowed, and falling away as the fruit ripens, inner scales linear lanceolate, erect. *Florets* linear, obtuse, toothed at the end, yellow, the outer ones crimson at the back. *Fruit* oblong, furrowed, tapering into a slender awn. *Pappus* white silky hairs.

Habitat.—Dry chalky ground; rare. Cambridgeshire, Norfolk, and Kent.

Biennial; flowering in June and July.

This plant is remarkable for its pale colour and its thickened peduncles becoming furrowed when in fruit. The flowers are small, pale yellow, closing early in the day, after expanding; when in bud the peduncles are recurved, but become erect. From the almond like

odour of the juice, it is probable that it possesses some medicinal property analogous to that of the *Lactucas*; but we are not aware of its having been applied to any particular use.

GENUS XI. CREPIS.—LINN. *Hawk's-beard*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* sub-imbricated, lax when in fruit usually ribbed. *Receptacle* naked. *Fruit* roundish, or sub-compressed, numerous striated. *Pappus* hairy, soft, deciduous.—Name *χενπίς*, a *slipper*, or *last*, in Greek; but why applied to this plant is not known.

1. *C. vi'rens*, Linn. (Fig. 1211.) *Smooth Hawk's-beard*. Stem branched, leafy, sub-corymbose; leaves smooth, the radical ones lanceolate, toothed, or runcinato-pinnatifid, the upper ones linear, sagitate; involucre with the outer scales small, linear, close pressed, the inner ones much longer, smooth; fruit oblong, smooth, ten ribbed.

Hooker, British Flora, ed. 4. vol. i. p. 291.—*C. tectorum*.—English Botany, t. 1111.—English Flora, vol. iii. p. 373.—Lindley, Synopsis, p. 158.

Root tapering. *Stem* erect, from one to two feet high, leafy, furrowed, smooth, sometimes slightly downy, and mostly of a pinkish colour, branched above in a sub-corymbose manner. *Leaves* smooth, bright green, the lower ones oblong lanceolate, variously toothed or runcinate in a pinnatifid manner, the upper ones linear, entire, erect, with two narrow lobes, at the base clasping the stem. *Flowers* small, solitary upon its slender peduncle. *Bractees* small, linear. *Involucre* smooth, or with the outer slender, linear, close pressed, scales downy, and the inner smooth. *Florets* bright yellow, linear, obtuse, toothed at the end. *Fruit* linear, oblong, slightly contracted above, smooth, ten ribbed. *Pappus* white, silky, roughish.

Habitat.—Dry pastures, roofs of cottages, old walls, &c.

Annual; flowering in July.

From the various kinds of situations of the growth of this plant, it is found variable in size and appearance, but it is constant in the above characters.

2. *C. bien'nis*, Linn. (Fig. 1212.) *Rough Hawk's-beard*. Stem branched, leafy, sub-corymbose; leaves hairy, the radical ones lanceolate, toothed, or runcinato-pinnatifid, the upper ones linear, sagitate, or toothed; involucre downy, the outer scales spreading, hispid at the back; fruit linear, narrowed above, smooth, thirteen ribbed.

English Botany, t. 149.—English Flora, vol. iii. p. 374.—Hooker, British Flora, ed. 4. vol. i. p. 291.—Lindley, Synopsis, p. 158.

Root tapering. *Stem* erect, stout, hollow, furrowed, pinkish, from three to four feet high, branched above in a corymbose manner, more or less rough, with pubescence. *Leaves* numerous, smooth or rough, with pubescence, the radical ones oblong, lanceolate, on longish foot-stalks, unequally toothed, those on the lower part of the stem cut into narrow entire or toothed lobes in a pinnatifid manner, the upper ones linear, somewhat lobed and arrow-shaped at the base, the uppermost ones linear, entire. *Inflorescence* a sub-corymbose many flowered panicle. *Bracteas* small, awl-shaped. *Florets* lemon-coloured, the outer ones crimson at the back. *Involucre* of numerous scales, downy, the outer ones small, spreading, mostly hispid at the back, the inner ones downy, with a smooth membranous margin. *Fruit* smooth, thirteen ribbed, thin, linear, tapering upwards. *Pappus* very white, roughish, silky.

Habitat—Chalky pastures and clayey soil; Kent, Suffolk, Lincolnshire, &c.; near Bangor, North Wales.

Biennial; flowering in June and July.

3. *C. pulchra*, Linn. (Fig. 1213.) *Small-flowered Hawk's-beard*. Stem leafy, paniculated above; leaves downy, the radical ones oblong, obovate, runcinate, the upper ones lanceolate, toothed, truncated at the base, and clasping the stem; panicle naked, spreading; involucre smooth; fruit linear, slender above, smooth, obscurely ten ribbed.

English Botany, t. 2325.—English Flora, vol. iii. p. 372.—Hooker, British Flora, ed. 4. vol. i. p. 291.—Lindley, Synopsis, p. 158.

Root tapering, the whole plant clothed more or less with soft pubescence. *Stem* erect, striated, hollow, from one to two feet high, leafy, branched above in a paniculated manner, and spreading. *Leaves* numerous, the radical ones oblong, obovate, more or less deeply toothed in a runcinate manner, tapering below into a winged foot-stalk, the upper ones lanceolate, truncated at the base, and clasping the stem with their acute or obtuse lobes. *Inflorescence* loose, widely spreading panicle. *Bracteas* small, lanceolate. *Flowers* solitary, rather small, bright yellow. *Involucre* smooth, the outer scales small, lax, membranous, soon withering, the inner ones linear, erect, the mid-rib becoming hard and prominent. *Fruit* linear, tapering upwards, finely striated with ten ribs. *Pappus* white, silky, rough.

Habitat.—Crumbling rocks on the hill of Turin, near Forfar, Scotland.

Annual; flowering in September.

4. *C. succisaefolia*, Tausch. (Fig. 1214.) *Succory-leaved Hawk's-beard*. Stem tall, corymbose above; leaves oblong, obtuse, obsoletely toothed, nearly smooth, the radical ones attenuated into a long foot-stalk, the upper ones sessile, amplexicaul; peduncles and involucre with glandular pubescence; involucre scales lanceolate, acute, the



1214 *Crepis succisaefolia.*



1215 *Crepis paludosa.*



1216 *Hieracium alpinum.*



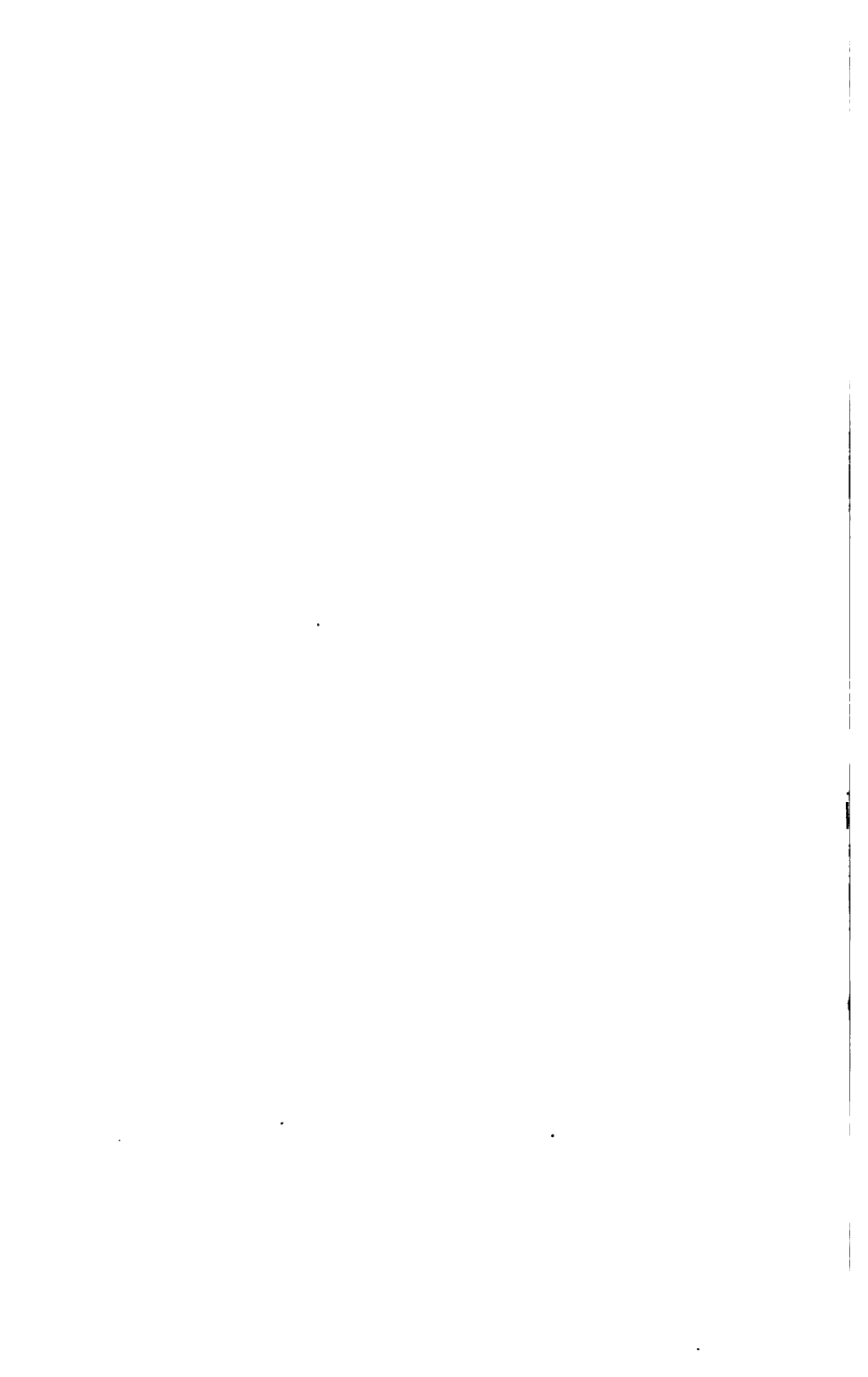
1217 *Hieracium pilosella.*



1218 *Hieracium auricula.*



1219 *Hieracium aurantiacum.*



outer ones much the smallest; fruit much striated, smooth, slender upwards.

Hooker, British Flora, ed. 4. vol. i. p. 291.—*Hieracium molle*, Jacq.—English Botany, t. 2210.—English Flora, vol. iii. p. 364.—Lindley, Synopsis, p. 160.

Root fibrous, the whole plant more or less clothed with close pressed hairs. *Stem* erect, angular, leafy, from twelve to eighteen inches high. *Leaves* numerous, the radical ones elliptic oblong, obtuse, entire, or minutely toothed on the margin, tapering at the base into a long slender footstalk, the upper leaves sessile, clasping the stem, lanceolate. *Inflorescence* a sub-corymbose panicle of numerous flowers, the peduncles and involucre clothed with glandular pubescence. *Flowers* bright yellow. *Florets* linear, striated, obtuse, finely toothed. *Involucre* of lanceolate taper pointed scales, the outer ones small, close pressed. *Bracteas* lanceolate, small. *Fruit* finely striated, smooth, pale brown, tapering upwards. *Pappus* white, silky, rough.

Habitat.—Woods, Scotland; near Forfar, falls of the Tummel, Glen Luss; Langton Woods, and near Renton, Berwickshire.

Perennial; flowering in July and August.

5. *C. paludosa*, Mænk. (Fig. 1215.) *Marsh Hawk's-beard*. Smooth. Stem erect, branched upwards, and sub-corymbose; radical leaves oblong, acute, runcinato-dentate, tapering into a footstalk, the upper ones lanceolate, sessile, and amplexicaul, toothed; involucre scales lanceolate, attenuated, clothed with glandular hairs; fruit ten ribbed.

Hooker, British Flora, ed. 4. vol. i. p. 291.—*Hieracium paludorum*. Linn.—English Botany, t. 1094.—English Flora, vol. iii. p. 363.—Lindley, Synopsis, p. 160.

Root fibrous. *Stem* erect, hollow, angular, smooth, pink below, about two feet high, branched above in a sub-corymbose manner. *Leaves* smooth, the lower ones oblong, taper-pointed, toothed in a runcinate manner, the base tapering into a rather long footstalk, the upper leaves sessile, clasping the stem, lanceolate, with a longer tapered point. *Inflorescence* sub-corymbose, of few flowers. *Bracteas* small, lanceolate. *Florets* short, linear, obtuse, finely toothed. *Involucre* clothed with glandular pubescence, the scales lanceolate, taper-pointed, the outer ones much the shortest. *Fruit* oblong, smooth, ten ribbed.

Habitat.—Woods and rocky places, where it is moist.

Perennial; flowering in August.

GENUS XII. HIERA'CIIUM.—LINN.—*Hawkweed*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involutum* imbricated. *Receptacle* dotted, naked, or with a few short hairs. *Fruit* roundish, furrowed, striated, or sub-prismatical, with an entire or crenated marginal ring at the top. *Pappus* hairy, sessile, fragile, persistent, mostly of a dirty brownish white colour.—Name *ἰεῖαξ*, a hawk, or falcon; so called from its being supposed formerly that birds of prey strengthened their power of vision by the use of the milky juice of plants known by this name.

* *Stem leafless, or with one leaf, single flowered.*

1. *H. alpinum*, Linn. (Fig. 1216.) *Alpine single flowered Hawk-weed*. Stem single flowered, nearly leafless, downy, and scattered over with glandular tipped hairs; the involucre clothed with silky pubescence; leaves oblong lanceolate, entire, or toothed, tapering into a footstalk, one or two on the stem sessile.

English Botany, t. 1110.—English Flora, vol. iii. p. 355.—Hooker, British Flora, ed. 4. vol. i. p. 393.—Lindley, Synopsis, p. 159.

β. *Halleri*, Koch. Radical leaves elliptic oblong, toothed, and often sub-hastate at the base, those of the stem (one or two) lanceolate, sessile.

β. Hooker, British Flora, ed. 4. vol. i. p. 293.—*H. Halleri*, Vill.—Lindley, Synopsis, p. 160.—*H. villosum*.—English Botany, t. 2379.—English Flora, vol. iii. p. 366.

Root somewhat woody, the whole plant more or less clothed with pubescence. *Stem* erect, simple, or sometimes branched at the base, round, striated, leafless, or bearing one or two sessile leaves. *Leaves* dark green, paler beneath, obovate, or oblong lanceolate, entire, or toothed, the radical ones all tapering into a footstalk, of greater or less length. *Inflorescence* a solitary head, rather large, bright yellow. *Florets* linear, obtuse, toothed. *Involucre* of imbricated lanceolate scales, of a dark green, almost black colour, clothed with long tawny silky hairs, and amongst these, as amongst those on the rest of the plant, are mixed other shorter ones, with a gland at the tip. *Fruit* oblong, angular, of a reddish brown colour, and minutely dotted. *Pappus* a pale dirty brown colour, roughish.

Habitat.—Elevated rocky mountains, especially in Scotland; Snowdon, near Llyn-y-Cwn, North Wales; β. Highland mountains of Scotland.

Perennial; flowering in July and August.

2. *H. Pilosella*, Linn. (Fig. 1217.) *Common Mousse-ear Hawk-weed*. Scape single flowered, leafless; scyons creeping, prostrate; involucre short, cylindrical; leaves obovate, lanceolate, glaucous green, bristly above, downy beneath.

English Botany, t. 1093.—English Flora, vol. iii. p. 356.—Hooker, British Flora, ed. 4. vol. i. p. 293.—Lindley, Synopsis, p. 159.

Root tapering, somewhat woody. *Stem* very short, putting out several prostrate creeping *scyons*, from four to six inches long, clothed especially towards the root with long spreading silky hairs, and bearing a few alternate small leaves. *Leaves* obovate lanceolate, obtuse, or lanceolate, tapering into a slender or broadish footstalk, a glaucous green above, and scattered over with long bristly hairs, pale beneath and hoary, with close woolliness. *Scaps* erect, three or four inches high, round, clothed with close hoary pubescence, and scattered over below, but above and the involucre almost black, with short black glandular tipped bristles. *Involucre* cylindrical, its scales lanceolate, imbricated, the inner ones thin, and membranous. *Florets* pale lemon colour, the outer ones with a crimson stripe at the back. *Fruit* oblong, smooth, striated, brown. *Pappus* pale dirty brown, rigid, rough.

Habitat.—Banks, open pastures, old walls, &c.; frequent.

Perennial; flowering from May to July.

From the habit of this plant it is very variable in its appearance, from being almost smooth sometimes, and at others very woolly, with close pubescence, and long spreading silky hairs. It is an extremely hardy plant, and often may be seen elevating its head, and expanding its elegant pale yellow flowers when all others are dried up by the heat and want of moisture.

** *Stem leafless, or with one leaf, many flowered.*

3. *H. Auricula*, Linn. (Fig. 1218.) *Orange Mouse-ear Hawk-weed*. Scape naked, or with a single leaf, two to five flowered; peduncles corymbose; *scyons* creeping; leaves elliptic, lanceolate, glaucous green, smooth, ciliated towards the base.

De Cand. Prod. vol. vii. p. 201.—Koch. Flora German. et Helv. p. 446.—*H. dubium*.—English Botany, t. 2332.—English Flora, vol. iii. p. 356.—Hooker, British Flora, ed. 4. vol. i. p. 293.—Lindley, Synopsis, p. 159.

Root fibrous. *Stem* very short, putting out several prostrate creeping *scyons*, four to eight inches long, with alternate small leaves. *Leaves* elliptic lanceolate, smooth, green above, glaucous beneath the margin, ciliated, especially towards the base, with silky or rigid hairs. *Flowering* stem erect, round, about four inches high, more or less clothed with glandular pubescence, bearing two or three heads of flowers, in a sub-umbellate manner. *Involucre* of lanceolate scales, imbricated and rough, with short glandular pubescence. *Florets* linear, pale lemon colour. *Fruit* with rough pale dirty brown *pappus*.

Habitat.—Moist places on mountains. "Said to have been found in Westmoreland and Scotland."

Perennial; flowering in July.

This species we only know from cultivated specimens; perhaps it may be overlooked by collectors for *H. pilosella*.

4. *H. asranthacum*, Linn. (Fig. 1219.) *Orange Hawk-weed*. Stem hairy, nearly leafless, bearing a corymb of from two to ten flowers; leaves ovate oblong, entire, green above, pale beneath, hairy; hairs simple, those of the involucre black and glandulose.

English Botany, t. 1469.—English Flora, vol. iii. p. 358.—Hooker, British Flora, ed. 4. vol. i. p. 293.—Lindley, Synopsis, p. 159.

Root fibrous. *Scyons* short. *Stem* erect, round, simple, or rarely branched, more or less clothed with black spreading hairs above, and on the involucre some of them are tipped with small glands. *Leaves* ovate oblong, or elliptic oblong, tapering into a footstalk, dark green above, pale, and somewhat glaucous beneath, rough, with rigid hairs, especially on the mid-rib beneath, nearly all radical, sometimes there is a small one about the middle of the stem, and above bracteated ones. *Inflorescence* a dense terminal cluster of from two to ten flowers, of a deep orange colour. *Involucre* rough and shaggy, black, its scales linear, unequal. *Florets* linear, obtuse, the end cut into fine deep teeth. *Fruit* cylindrical, abrupt, brown, striated. *Pappus* dirty brown, rough, very fragile.

Habitat.—Shady places; Fallsworth, near Manchester, and near the sea, Scarbro'; in Scotland, woods near Banffshire and Tarref, Coalston woods, E. Lothian, woods east of Kenmore.

Perennial; flowering in June and July.

The crowded tuft of fine deep rich orange coloured flowers of this plant has obtained for it a place in the borders of many rustic gardens, and from thence it is probable that it has escaped, and become naturalized, though not anywhere a common plant. By the country people it is often called *Grim-the-collier*, from the stem and involucre often being clothed with black rigid bristles, giving the plant a dark green appearance.

. *Stem with one or two leaves, many flowered.*

5. *H. muro'rum*, Linn. (Fig. 1220.) *Wall Hawk-weed*. Stem with

H. angustifolium, Hepp. (*Narrow-leaved Mouse-ear Hawk's-weed*). "Leaves lanceolate, acute, nearly entire, coarsely hairy, green on both sides; scyons scarcely as long as the leaves; stem downy and hairy, corymbose; involucre shaggy."—Smith.

De Cand. Prod. 7. p. 204.—*H. Auricula*.—English Botany, t. 2368.—English Flora, vol. iii. p. 357.—Hooker, British Flora, ed. 4. vol. i. p. 293.—Lindley, Synopsis, p. 159.

Habitat.—On Dale head, near Grassmere, Cumberland.—Hudson.

Perennial; flowering in July.

This very doubtful native plant has not been found since the time of Hudson. We have given Smith's description of it, but think it ought to be expelled from the list of our Flora.



1220

Hieracium murorum



1221

Hieracium murorum var. *pulmonarium*



1222 *Hieracium murorum* var. *Lawsoni*.



1223

Hieracium sylvaticum.



1224

Hieracium cerinthoides.



1225

Hieracium amplexicale.

one petiolated leaf, branched upwards, sub-corymbose; peduncles and involucre hoary, and with a few black glandular bristles; leaves downy, the radical ones ovate, acute, sub-cordate at the base, and more or less deeply toothed, the teeth mostly pointed downwards.

English Botany, t. 2082.—English Flora, vol. iii. p. 359.—Hooker, British Flora, ed. 4. vol. i. p. 294.—Lindley, Synopsis, p. 159.

β. pulmona'rium, Hook. (Fig. 1221.) Leaves narrower, gradually tapering into a footstalk, and more toothed, the whole plant more abundantly clothed with soft pubescence, especially the base of the stem and petioles.

Hooker, British Flora, ed. 4. vol. i. p. 294.—*H. pulmonarium*.—English Botany, t. 2307.—English Flora, vol. iii. p. 262.—Lindley, Synopsis, p. 159.

γ. Lawsoni, Hook. (Fig. 1222) Leaves lanceolate, nearly entire, silky, especially on the petioles.

Hooker, British Flora, ed. 4. vol. i. p. 294.—*H. Lawsoni*.—English Botany, t. 2083.—English Flora, vol. iii. p. 362.—Lindley, Synopsis, p. 160.

δ. humile. "Small, almost glabrous, rigid, single flowered."—Hooker.

ι. nigra. "Small, flaccid, single flowered; involucre with copious black hairs."—Hooker.

Root fibrous. *Stems* one, or several, erect, from one to two feet high, round, or somewhat angular, and striated, more or less hairy, especially at the base, branched upwards in a sub-corymbose manner, and bearing from one to six rather large yellow flowers. *Leaves* downy, dark green above, pale, and often purple beneath, the petioles and base of the leaves often woolly, ovate, acute, ovate lanceolate, elliptic lanceolate, or lanceolate, entire, or more or less toothed, especially at the base, the teeth slender, all radical, except one upon the stem. *Bractees* small, the upper part of the stem, peduncles, and involucre clothed with hoary pubescence, and often mixed with it are black bristly hairs, often glandular. *Involucre* scales linear, black, pale on the margin. *Florets* linear, obtuse, toothed at the end. *Fruit* black, linear, abrupt, striated, *pappus* very fragile, dirty brown, rough.

Habitat.—Woods, old walls, rocks, &c., common; *β.* valleys in Scotland; *γ.* elevated mountainous situations; *δ.* Clove Mountains, Scotland; *ι.* Mountains near Glen Shee.—*Mr. Jos. Hooker*.

Perennial; flowering in June and July.

The varieties of this the most common of the many flowered species of this troublesome genus, are extremely great and puzzling, from the plant growing in such various situations and climates. We have followed Hooker in uniting the *H. pulmonarium* and *Lawsoni*, from being unable to define the limits of them as separate species.

**** *Stem with many leaves, many flowered.*

6. *H. sylvaticum*, Sm. (Fig. 1223.) *Wood Hawk-weed*. Stem with several leaves branched upwards, and sub-corymbose, slightly hairy, and more or less downy beneath; the involucre leaves ovate lanceolate, or lanceolate, toothed, with the sharp teeth pointing upwards, somewhat hairy, the lower ones petiolated, the upper sessile; involucre with very short pubescence.

English Botany, t. 2031.—Hooker, British Flora, ed. 4. vol. i. p. 294.—English Flora, vol. iii. p. 361.—Lindley, Synopsis, p. 159.—*H. vulgatum*, Fries.—*H. murorum*, α. Smith Fl. Brit. p. 830.

β. *maculatum*. Leaves ovate lanceolate, with large teeth, and spotted with dark purple.

Hooker, British Flora, ed. 4. vol. i. p. 294.—*H. maculatum*.—English Botany, t. 2121.—English Flora, vol. iii. p. 360.—Lindley, Synopsis, p. 159.

γ. *pictum*. Leaves lanceolate, spotted and clouded with purple.—Hooker.

H. pictum, Schleich.

Root with long stout fibres. *Stem* erect, from one to two feet high, angular or striated, and somewhat hairy, leafy, branched above in a sub-corymbose manner. *Leaves* mostly numerous, ovate lanceolate, lanceolate, or oblong, somewhat hairy, toothed, or entire, and in β. *maculatum* and γ. *pictum* more or less spotted or clouded with purple, the lower leaves on longish footstalks, the upper sessile. *Inflorescence* sub-corymbose. *Flowers* not very large, bright yellow. *Florets* linear, obtuse, cut at the end into fine slender teeth. *Involucre* of lanceolate teeth, more or less clothed with downy pubescence, and often with black hairs intermixed with it. *Fruit* rather slender, angular, or striated. *Pappus* dirty white, rough, fragile.

Habitat—Mountain woods, rocks, old walls, banks, &c.; frequent. β. γ. not unfrequent in Scotland.

Perennial; flowering in August.

7. *H. cerinthoides*, Linn (Fig. 1224.) *Honeywort leaved Hawk-weed*. Stem corymbose, hairy above, and involucre with glandular hairs; leaves a glaucous green, hairy, entire, or slightly toothed, the radical ones oblong lanceolate, or obovate acute, petiolated, the upper ovate lanceolate, sessile, semi-amplexicaul.

English Botany, t. 2378.—English Flora, vol. iii. p. 365.—Hooker, British Flora, ed. 4. vol. i. p. 294.—Lindley, Synopsis, p. 160.—*H. longifolium*, Schleich.

Root somewhat woody. *Stem* about two feet high, erect, stout, cylindrical, striated, leafy, nearly smooth. *Leaves* a somewhat glaucous green, more or less hairy, especially on the mid-rib and margins, the lower and radical ones ovate lanceolate, or oblong lanceolate, acute, tapering into a long footstalk, the upper ones narrower lanceolate, sessile, and partly embracing the stem, all entire, or slightly toothed.

Inflorescence a terminal sub-corymbose panicle. *Flowers* large, pale yellow, handsome. *Peduncles*, bractea, and involucre, clothed with downy pubescence, with short glandular hairs intermixed with it. *Florets* linear, obtuse, cut into fine linear teeth at the end. *Fruit* reddish brown, linear, obtuse, angular. *Pappus* a dirty white, roughish.

Habitat.—Rocks in the Highlands of Scotland, Mr. G. Don; but Sir J. W. Hooker says he has not seen a native specimen, except the one given to him by Mr. G. Don.

Perennial; flowering in August.

This is found not unfrequent in the mountainous and alpine districts of the Continent. Its flowers are large and handsome pale lemon colour.

8. *H. amplexicaule*, Linn. (Fig. 1225.) *Amplexicaul Hawk-weed*. Glanduloso-pubescent; stem corymbose; radical leaves elliptic oblong, or oblong, tapering into a footstalk, toothed, the upper ones sessile, sub-cordate, amplexicaul, and the bractea entire.

English Botany, Suppl. t. 2690.—Hooker, British Flora, ed. 4. vol. i. p. 295.—Lindley, Synopsis, p. 160.

Root woody. *Stem* erect, about a foot high, round, striated, and clothed as well as the leaves with brown glandular pubescence, giving the plant a greasy feel between the fingers. *Leaves* a somewhat glaucous green, the lower and radical ones more or less oblong lanceolate, tapering into a footstalk, the upper ones sessile, broadly heart-shaped at the base, embracing the stem, its point tapering. *Inflorescence* sub-corymbose. *Bracteas* small, ovate. *Involucre* of numerous awl-shaped imbricated scales, very downy and hairy. *Florets* linear, obtuse, pale yellow, finely toothed at the end, downy at the back and top of the tube. *Fruit* black, linear, obtuse, striated. *Pappus* dirty white, rough, very fragile.

Habitat.—Walls of the Castle of Cleish, Kinross-shire; Clove mountains; on the walls of the Oxford Botanical Garden.

Perennial; flowering in August.

9. *H. denticulatum*, Smith. (Fig. 1226.) *Small-toothed Hawk-weed*. "Stem erect, leafy, solid, many flowered; symose with downy glandular stalks; leaves sessile, elliptic-lanceolate, finely toothed, smoothish, glaucous beneath."

English Botany, t. 2122.—English Flora, vol. iii. p. 369.—Hooker, British Flora, ed. 4. vol. i. p. 295.—Lindley, Synopsis, p. 160.

This is a very doubtful species, and is distinguished only from the following, by its leaves being a somewhat glaucous green, sessile, and scarcely amplexicaul, distinctions which seem scarcely sufficient to make it a good variety.

15. *H. prenanthoides*, Vill. (Fig. 1227.) *Rough-bordered Hawk-weed*. Stem erect, leafy, hairy; panicle sub-corymbose; peduncle

and involucre rough, with glandular hairs; leaves oblong lanceolate, heart-shaped and amplexicaul at the base, upper ones gradually smaller, ovate, heart-shaped, taper-pointed, all glaucous beneath, and remotely and unequally toothed.

English Botany, t. 2285.—English Flora, vol. iii. p. 369.—Hooker, British Flora, ed. 4. vol. i. p. 295.—Lindley, Synopsis, p. 161.

Root woody. *Stem* erect, from three to four feet high, round, striated, simple, hairy, leafy, branched above. *Leaves* all sessile, pale green, glaucous beneath, rough, especially towards the margin and edges, with rigid tawny hairs, the margin toothed, with small distant irregular teeth, the lower ones lanceolate, broadly ovate, heart-shaped at the base, and clasping the stem, the upper ones smaller, with a longer more tapering point. *Inflorescence* sub-corymbose, of numerous yellow flowers, the *peduncles* and *involucre* rough, with numerous dark glandular hairs. *Florets* linear, obtuse, finely toothed at the end. *Fruit* linear, obtuse, dark brown, striated. *Pappus* dirty white, rough, very fragile.

Habitat.—River sides in Scotland; rare. Banks of the Esk; near Pitmain; in Glen Lyon and banks of the Don, in Braemar.

Perennial; flowering in August.

11. *H. Saban'dum*, Linn. (Fig. 1228.) *Shrubby broad-leaved Hawk-weed*. Stem erect, very leafy, mostly hairy, paniculated upwards, its branches sub-corymbose; peduncles and involucre hoary; leaves ovate lanceolate, toothed, and hairy, the upper sessile, amplexicaul, the lower ones tapering into a footstalk.

English Botany, t. 349.—English Flora, vol. iii. p. 368.—Hooker, British Flora, ed. 4. vol. i. p. 294.—Lindley, Synopsis, p. 160.

Root fibrous. *Stem* erect, from two to three feet high, stout, round, somewhat furrowed, mostly clothed with spreading brown slender hairs, very leafy, simple below, branched in a paniculated manner above. *Leaves* ovate lanceolate, more or less toothed, but in an irregular manner, dark green, and nearly smooth above, pale beneath, and somewhat hairy, the lower leaves tapering into a footstalk, the upper sessile, somewhat heart-shaped at the base, and embracing the stem. *Inflorescence* terminating the stem and branches in a sub-corymbose manner. *Peduncles* and awl-shaped bractea hoary. *Involucre* of linear lanceolate more or less hoary scales. *Florets* bright yellow, linear, obtuse, the end finely toothed. *Fruit* linear, obtuse, the end finely toothed. *Fruit* linear, obtuse, reddish brown, striated. *Pappus* dirty white, rough, very fragile.

Habitat.—Groves, thickets, shady places, and old walls; frequent. Perennial; flowering in August and September.

12. *H. umbellatum*, Linn. (Fig. 1229.) *Narrow-leaved Hawk-weed*. Stem erect, simple, very leafy, smooth or hairy; flowers sub-umbellate; peduncles downy; involucre smooth, its scales recurved at the



1296 *Hieracium denticulatum.*



1297 *Hieracium prenanthoides.*



1298 *Hieracium sabaudum*



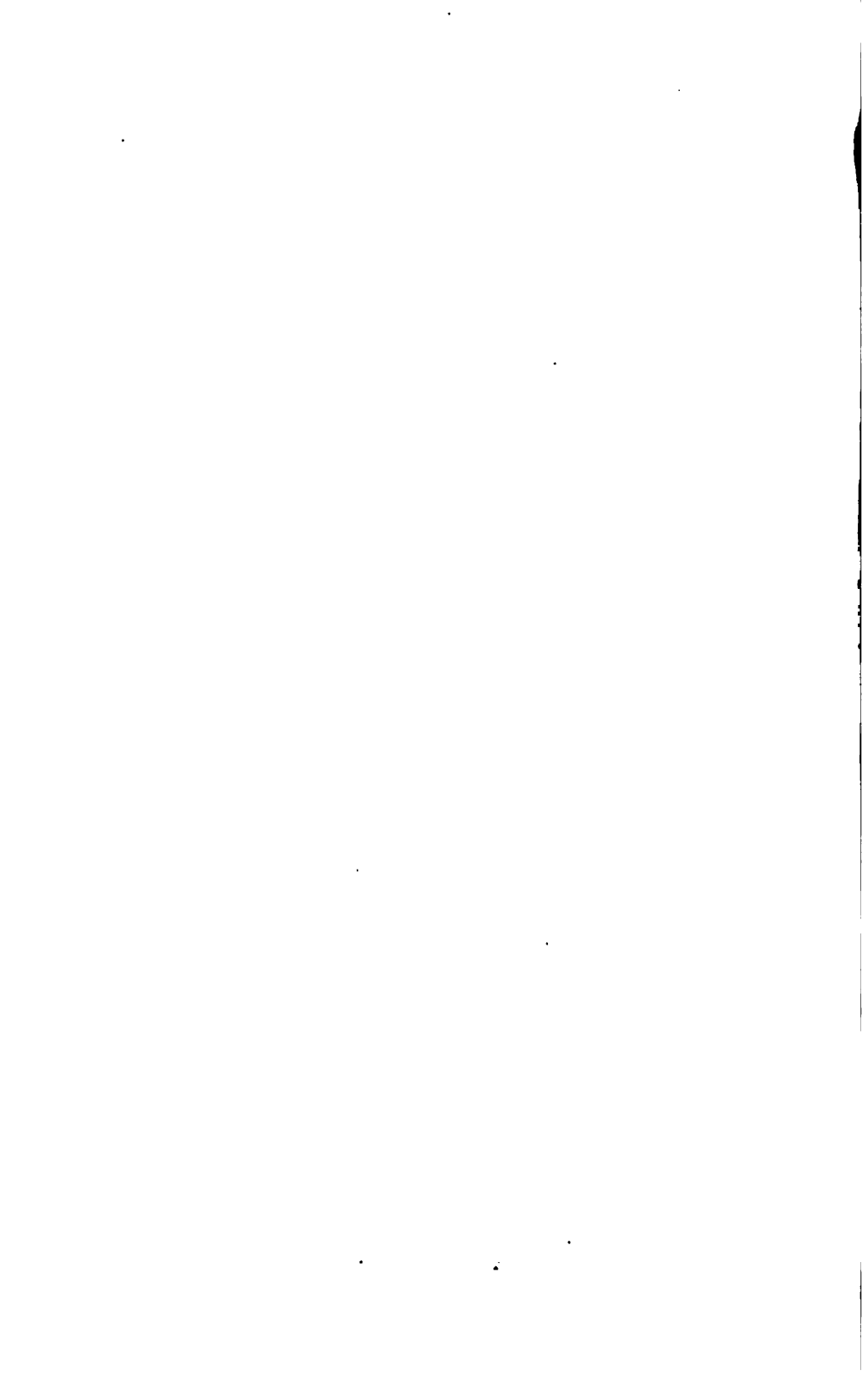
1299 *Hieracium umbellatum.*



1230 *Cichorium intybus.*



1231 *Lapsana communis.*



end; leaves lanceolate, linear lanceolate, nearly smooth, toothed or entire, the upper sessile, the lower petiolated.

English Botany, t. 1771.—English Flora, vol. iii. p. 370.—Hooker, British Flora, ed. 4. vol. i. p. 295.—Lindley, Synopsis, p. 161.

Root fibrous. *Stem* erect, about three feet high, round, striated, leafy, simple, more or less downy, or smooth. *Leaves* lanceolate, or linear lanceolate, scattered, the radical tapering into a footstalk, the upper sessile, all more or less toothed, dark green above, pale beneath, smooth or hairy, sometimes rough, with bristly pubescence, especially on the margin and mid-rib. *Inflorescence* a terminal sub-umbellate corymb, the *bracteas* small, linear, and peduncles quite smooth, or minutely downy or hairy. *Flowers* not very numerous, bright yellow, about an inch across. *Involucre* smooth, of linear imbricated scales. *Florets* linear, obtuse, finely toothed at the end. *Fruit* linear, obtuse, angular, and finely dotted, reddish brown. *Pappus* a dirty white, very fragile, rough.

Habitat.—Shady places, and stony or rocky situations.

Perennial; flowering in August and September.

This is readily distinguished from all the others by its narrow lanceolate leaves. In this respect, however, it is somewhat variable, but not so much so as in conjunction with its other characters, to render it a difficult species to determine.

GENUS XIII. CICHORI'UM.—LINN. *Succory*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* of eight scales, united at the base, and surrounded by five smaller outer ones. *Receptacle* naked, or slightly hairy. *Fruit* striated. *Pappus* scaly, sessile, shorter than the fruit.—Name *chikoury sh*, in Arabic.

1. *C. In'tybus*, Linn. (Fig. 1280.) *Wild Succory*. Heads of flowers two or more, sessile and pedunculated in the axis of the leaves; upper leaves lanceolate, with a broad base embracing the stem, the lower ones runcinate.

English Botany, t. 539.—English Flora, vol. iii. p. 380.—Hooker, British Flora, ed. 4. vol. i. p. 296.—Lindley, Synopsis, p. 162.

Root tapering, fleshy, milky. *Stem* erect, from two to three feet high, round, furrowed, branched, leafy, rough, with rigid hairs. *Leaves* bright, rough, the lower runcinate, from four to six inches long, tapering into a footstalk, the lobes entire, or toothed, the upper leaves much smaller, sessile, less lobed and toothed, the floral ones linear, or lanceolate, dilated at the base, and embracing the stem. *Inflorescence* axillary. *Flowers* large, beautiful bright blue, in pairs, or several together, sessile, or elevated on a short peduncle. *Involucre*

scales rough, the outer ones short, ovate lanceolate, spreading, the inner linear, erect. *Florets* linear, obtuse, five toothed at the end. *Receptacle* naked, or slightly hairy, and pitted. *Fruit* angular, striated. *Pappus* short scales.

Habitat.—Borders of fields, road sides, and waste places, especially in a sandy or gravelly soil.

Perennial; flowering in July and August.

The bright blue colour of the flowers of this plant entitle it to a place in the flower garden, but the straggling stems prevent its being cultivated as a border flower. The leaves of the young plant blanched form a favourite winter and spring salad. In France the long tapering roots are collected and packed up in cellars or dark places, protected from the frost and cold, with sand or earth, the crowns only of the roots being exposed, they then put out leaves, and as they are protected from the light and blanched, are, if quick grown, very tender, with a pleasant flavour: by this mode of cultivation they are enabled to supply the table all the winter with an esteemed salad. The roots, as well as the leaves, by cultivation in a light soil, become much larger, and on the Continent the roots are cut into small pieces and dried, and are afterwards roasted and used as a substitute for coffee. By many persons, the powder thus prepared, and mixed with an equal weight of powdered coffee, is preferred to the coffee alone; indeed it is said that on the Continent, where so much coffee is used, it is always prepared in this manner, and that coffee alone is never made use of. Great quantities of the Endive roots are annually imported into England for the same purpose. The plant cultivated as food for cattle is said to be very profitable, especially for cows, as it greatly increases the quantity of milk; but it has never come into general cultivation for that purpose, though in some parts of Germany, and also in the North of Italy, we have seen large plots of land cultivated with it. The *C. Endivia*, Linn., is distinguished by its floral leaves being broadly ovate; in other respects it is the same, and by some Botanists it is thought to be only a variety of *C. Intybus*, and not a distinct species.

GENUS XIV. LAPSA'NA.—LINN. *Nipple-wort*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* of numerous linear lanceolate scales, and small scattered ones at the base, erect, and unchanged in fruit. *Receptacle* naked. *Fruit* compressed, striated, deciduous. *Pappus* none. Name from *λαπαζω*, to purge; from its laxative properties.

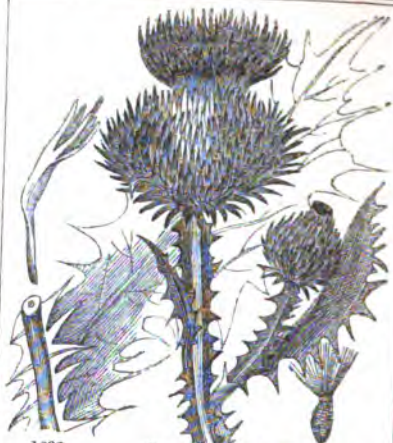
1. *L. communis*, Linn. (Fig. 1231.) *Common Nipple-wort*. Invo-





1232

Arnoseris pusilla.



1233

Onopordum Acanthium.



1234

Carlina vulgaris.



1235

Carduus nutans



1236

Carduus acanthoides.



1237

Carduus tenniflorus.

lucre scales angular in fruit ; stem paniculated above ; leaves toothed, ovate, or sub-cordate, the lower ones lyrate.

English Botany, t. 844.—English Flora, vol. iii. p. 378.—Hooker, British Flora, ed. 4. vol. i. p. 295.—Lindley, Synopsis, p. 157.

Root fibrous. *Stem* erect, round, striated, leafy, smooth, or somewhat downy, from one to three feet high, branched above, slender. *Leaves* thin, dark green, very pliant, smooth, or somewhat downy, toothed, and somewhat angular, petiolated, the lower ones lyrate, the upper ovate, acute, or lanceolate. *Inflorescence* paniculated, its branches slender. *Bractees* small. *Involucre* smooth, the outer scales small, scattered, the inner ones linear lanceolate, erect, all becoming somewhat angular in fruit, from the enlargement of the midrib. *Flowers* small, bright yellow. *Florets* linear, obtuse, scarcely toothed at the end. *Fruit* linear, pale brown, ribbed, and striated. *Pappus* wanting.

Habitat.—Waste and cultivated grounds ; common.

Annual ; flowering in June and July.

Formerly this plant was used, and it is said with advantage, in the cure of sore nipples and breasts, hence its English name of Nipple wort ; but it is now quite out of use.

GENUS XV. ARNO'SERIS.—GÆRTN. *Swine's Succory*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* of numerous linear lanceolate scales, and small scattered ones at the base, converging into a globose head when in fruit. *Receptacle* naked. *Fruit* obovate, pentagonal, furrowed, deciduous. *Pappus* none.

1. *A. pusilla*, Gært. (Fig. 1232.) *Swine's Succory*. Scape branched ; peduncles swollen, and fistulous upwards ; leaves all radical, obovate, oblong, toothed.

De Cand. Prod. 7. p. 70.—*Hyoseris minima*, Linn.—English Botany, t. 95.—*Lapsana pusilla*, Willd.—English Flora, vol. iii. p. 378.—Hooker, British Flora, ed. 4. vol. i. p. 296.—Lindley, Synopsis, p. 157.

Root tapering, and branched. *Leaves* all radical, ovate oblong tapering into a footstalk, roughish, with short hairs, strongly toothed. *Scapes* several, simple, and single flowered, or branched upwards, from four to six inches high, somewhat hairy, pink below, green above, and swollen into a club-shaped form, hollow. *Involucre* smooth, its scale linear lanceolate, all converging into a globose head when in fruit. *Flowers* small, bright, pale yellow. *Florets* small, linear, obtuse, finely toothed. *Fruit* angular, smooth, crowned with an elevated border. *Pappus* wanting.

Habitat.—Corn fields in a gravelly or sandy soil.

Annual ; flowering in June.

GENUS XVI. ONOPORDUM.—LINN *Cotton-thistle.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* tumid, imbricated, the scales spreading, and spinous. *Receptacle* excavated, like honey-comb. *Fruit* compressed, four angled, and transversely furrowed. *Pappus* hairy, rough, united into a ring at the base, deciduous.

1. *O. Acan'thium*, Linn. (Fig. 1233.) *Common Cotton-thistle.* Scales of involucre spreading, awl-shaped; leaves elliptic-oblong, sinuated, spinous, and decurrent, woolly on both sides.

English Botany, t. 977.—English Flora, vol. iii. p. 396.—Hooker, British Flora, ed. 4. vol. i. p. 299.—Lindley, Synopsis, p. 152.

Root tapering, the whole plant covered with a white cottony pubescence, like a fine cobweb, especially on the under sides of the leaves and stem. *Stem* erect, from four to five feet high, branched, striated, angular, and winged. *Leaves* elliptic-oblong, lobed, sinuated, and spinous, the spines hard, rigid, pungent, all decurrent, forming the wings of the stem, the lower leaves very large, spreading. *Inflorescence* paniculate, the *peduncles* winged. *Flowers* large, a deep purplish rose colour. *Florets* tubular, the mouth cut into five narrow segments. *Involucres* globose, its scales awl-shaped, pungent, spreading, cottony. *Fruit* obovate, smooth, brown. *Pappus* dirty white, of numerous rough bristly rays, united into a ring at the base, sessile, deciduous.

Habitat.—Road sides, waste places, &c., especially in a gravelly soil; not unfrequent.

Biennial; flowering in August.

This is often called the wild Artichoke, or Al-cachofa, of the Spaniards, from its fleshy receptacle being like the Artichoke esculent, and its young growing branches, when stripped of peel, were formerly boiled and brought to table; but it is rather bitter, and as a vegetable is not now cultivated. The expressed juice of the stems and leaves is said by Eller to be an useful application to cancers and indolent ulcers, and its astringent roots have been used to stop discharges from the mucous membrane. The seeds of this species are large, and are, as are also some others of the thistle tribe, a favourite food of goldfinches and other small birds. They are very oleiferous, and M. Durand says that twenty-two pounds of the heads yield twelve pounds of seeds, from which by the aid of heat may be expressed about three pounds of oil fit for burning. It is this plant which is generally considered the true Scotch thistle—

“Proud thistle! emblem dear to Scotland's sons,

Begirt with threatening points, strong in defence,

Unwilling to assault.”

It is the national badge of Scotland, and has given its title to an order

of Knighthood, "the most ancient Order of the Thistle," instituted by King Achias, collar added by King James V., revived by King James II. in 1687, and re-established by Queen Anne 31st December, 1703." The star of this order consists of a St. Andrew's cross, of silver embroidery, with rays emanating from between the points of the cross, in the centre of which is a thistle of gold and green upon a field of green, surrounded by a circle of gold. The collar is of thistles, intermingled with sprigs of rue. The motto is "Nemo me impune lacescit," "Nobody annoys me with impunity."

GENUS XVII. CARLI'NA.—LINN. *Carlina-thistle*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, tumid, the outer scales with numerous spines, spreading at the points, the inner mostly simple, and acute, the innermost much longer, membranous, ligulate, coloured, spreading like rays. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* feathery, united at the base into a ring.—Name "the same as *Carolina* from a tradition that the root was shown by an angel to *Charlemagne*, as a remedy for the plague which prevailed in his army."

1. *C. vulga'ris*, Linn. (Fig. 1284.) *Common Carlina-thistle*. Stem many flowered, corymbose, pubescent; leaves lanceolate, unequally spinous, and sinuated, downy beneath; bractees shorter than the head.

English Botany, t. 1144.—English Flora, vol. iii. p. 398.—Hooker, British Flora, ed. 4. vol i. p. 299.—Lindley, Synopsis, p. 154.

Root tapering. *Stem* erect, about a foot high, leafy, downy, simple below, branched above in a sub-corymbose manner. *Leaves* lanceolate, sinuated, very spiny, of a hard rigid texture, green above, pale and downy beneath, sometimes woolly, and occasionally quite smooth, the lower and root leaves petiolated, the upper ones sessile. *Flowers* solitary, terminating the branches. *Involucre* outer scales leafy, spinous, not longer than the head, the inner ones simple, the innermost long, linear, cream coloured, of a membranous rigid hard texture, spreading like the rays of the flower. *Florets* small, short, tubular, the mouth five-cleft, pink. *Antthers* and *stigma* yellow. *Fruit* compressed, crowned by the pale dirty yellow feathery *pappus*, united into a ring at the base. *Receptacle* with numerous paleaceous scales, linear, and deeply cut into several slender bristles.

Habitat.—Dry hilly pastures; rare in the West of Scotland, Bennauehead, Isle of Arran.

Biennial; flowering in June.

The flowers of this species, as well as the others of this genus, are very durable from the hard horny nature of the ray-like involucre; they are very sensitive to the presence of moisture in the atmosphere, and close or expand according to its dry or humid state. On the Continent it is common to see fastened near the door of the cottages a flower of one of the species, and they judge of the likelihood of rain by its being closed or expanded. This, as well as the *C. caulescens* and *C. acutis*, have been used in medicine, but they are now entirely abandoned as to any medicinal property which they may possess.

GENUS XVIII. CARDUUS.—LINN. *Thistle*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucre* imbricated, tumid, the scales simple, spinous at the point. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* feathery, united at the base into a ring, deciduous.—Name, according to Theis, derived from the Celtic word *ard*, a *point*, in allusion to the spinous involucre.

* *Leaves decurrent*.

1. *C. nutans*, Linn. (Fig. 1235.) *Musk-thistle*. Leaves decurrent, spinous, deeply sinuated; heads drooping, solitary; scales of involucre lanceolate, spinous, cottony, spreading.

English Botany, t. 1112.—English Flora, vol. iii. p. 385.—Hooker, British Flora, ed. 4. vol. i. p. 208.—Lindley, Synopsis, p. 155.

Root tapering. *Stem* erect, from two to three feet high, striated and furrowed, more or less branched, mostly cottony. *Leaves* lanceolate, deeply sinuated into pinnatifid lobes, the lobes sub-palmate, ciliated, with small spines, and terminated with a much larger stouter one, sessile, decurrent, forming narrow lobed spinous wings to the stem, more or less cottony, especially beneath along the mid-ribs and veins. *Flowers* terminal, solitary, drooping, on a round simple or winged pedicle, large, sub-globose, purple, handsome. *Involucre* cottony, of numerous lanceolate spinous scales, the lower ones spreading, the upper erect. *Florets* tubular, funnel-shaped, the tube slender, curved, limb of five linear segments. *Athers* purple. *Fruit* ovate, compressed, pale brown, smooth, polished with dotted lines. *Pappus* of white silky rather rough rays, united into a ring at the base.

Habitat.—Road sides, dry hilly places, &c.

Biennial; flowering in July and August.

The flowers are large and handsome, and exhale a musky odour, especially in the mornings and evenings in warm weather.

2. *C. acanthoides*, Linn. (Fig. 1236.) *Wetted-thistle*. Leaves decurrent, sinuated, and spinous; heads globose, nearly sessile; scales of involucre lanceolate, acuminate, slightly recurved.

English Botany, t. 973.—English Flora, vol. iii. p. 386.—Hooker, British Flora, ed. 4. vol. i. p. 297.—Lindley, Synopsis, p. 155.

Root tapering. *Stem* erect, about three feet high, mostly much branched, winged on every side with narrow sinuated spinous wings from the angles of the lanceolate deeply sinuated *leaves*, the lobes ovate, sub-palmate, toothed and spinous, green on both sides, and nearly smooth, the radical leaves on angular footstalks. *Flowers* mostly several, crowded at the top of the stem and branches, not very large, a deep purplish crimson. *Involucre* scales lanceolate, acuminate into a spinous point, downy, somewhat recurved at the point. *Florets* tubular, the limb deeply divided into five narrow segments. *Fruit* compressed. *Pappus* of numerous white silky roughish rays, very fragile, and united into a ring at the base.

Habitat.—Road sides and waste places; not very common.

Annual; flowering in June and July.

It is sometimes found with white flowers, but in other respects not different.

3. *C. tenni'florus*, Curt. (Fig. 1237.) *Slender flowered thistle*. Leaves decurrent, sinuated, and spinous, cottony beneath; heads several, crowded, sessile, cylindrical; involucre scales lanceolate, erect.

English Botany, t. 412.—English Flora, vol. iii. p. 386.—Hooker, British Flora, ed. 4. vol. i. p. 297.—Lindley, Synopsis, p. 156.

Root small, tapering. *Stem* erect, three or four feet high, slightly branched above, angular, and clothed with cottony down, strongly winged from the top, lobed, toothed, and spinous. *Leaves* lanceolate, sessile, the radical ones oblong, all more or less cottony, especially beneath, deeply sinuated into pinnatifid lobes, ciliated with teeth and stout pungent spines. *Flowers* several, crowded, sessile at the top of the stem and branches, a pale rose colour. *Involucre* cylindrical, of erect lanceolate spinous scales. *Florets* tubular, the limb cut into five narrow segments. *Fruit* ovate, compressed, grey, shining. *Pappus* of silky roughish rays, united into a ring at the base.

Habitat.—Waste sandy places, especially near the sea, and about towns.

Annual; flowering in June and July.

**** Leaves sessile.**

4. *C. Maria'nus*, Linn. (Fig. 1238.) *Milk-thistle*. Leaves amplexicaul, waved, and spinous, the radical ones pinnatifid; involucre scales leafy at the base, and toothed, the point a long channelled recurved spine.

English Botany, t. 976.—English Flora, vol. iii. p. 387.—Hooker, British Flora, ed. 4. vol. i. p. 297.—*Silbyum*, Gärtn.—Lindley, Synopsis, p. 154.

Root tapering. *Stem* erect, from four to five feet high, round, branched, leafy, smooth. *Leaves* all sessile, oblong, dark green, smooth, shining, the veins beautifully white, giving the leaf a marbled appearance, the upper ones waved, and embracing the stem with their heart-shaped base, the lower ones sinuated in a pinnatifid manner, all spinous on the margin. *Flowers* terminal, solitary, large, dark purplish crimson. *Involucre* swollen, its scales ovate, and leafy at the base, spinous on the margin, suddenly contracted into a long hard channeled recurved point. *Florets* tubular, the limb deeply cut into five narrow segments. *Filaments* united. *Fruit* ovate, large, polished. *Pappus* of numerous silky rough rays, united into a ring at the base.

Habitat.—Banks and waste places; rare in Scotland, about Edinburgh and Dunbarton Rock.

Biennial; flowering in July.

This species is readily distinguished by its beautiful marble veined leaves; which, as Sir J. E. Smith remarks, "Botanists and Physicians of the dark ages report to have been caused by the milk of the Virgin Mary falling upon a plant of this species, and that all its progeny have retained the blessed stain. There is, however," he further remarks, "a refractory, heretical variety found near London whose leaves remain entirely green." The leaves, when mature, are said to possess sudorific and aperient properties. The young leaves and roots are used in Italy as a vegetable, and may be purchased at the corners of the streets of Rome during the months of March and April in great abundance.

GENUS XIX. CIRCUM.—TORN. *Plume-thistle*.

Nat. Ord. COMPOSITEÆ. JUSS.

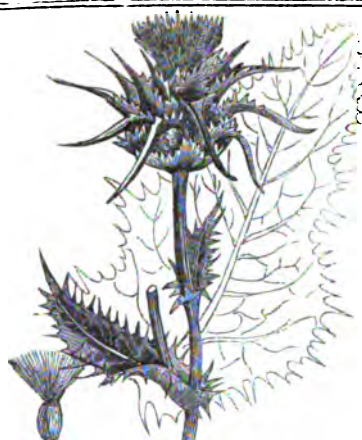
GEN. CHAR. *Involucrum* ovate, imbricated, the scales simple, spinous at the point. *Receptacle* paleaceous, the scales cut into bristle-shaped segments. *Pappus* feathery, united at the base into a ring, deciduous.

* *Leaves decurrent*.

1. *C. lanceolatum*, Scop. (Fig. 1239.) *Spear Plume-thistle*. Leaves decurrent, deeply pinnatifid, their segments generally two lobed, spreading, spinous, hispid on the upper surface, downy on the under; involucre ovate, woolly, its scales lanceolate, spreading; heads solitary.

De Cand. Prod. 6. p. 636.—*Carduus lanceolatus*, Linn.—English Botany, t. 107.—*Cnicus*, L. Willd.—English Flora, vol. iii. p. 388.—Hooker, British Flora, ed. 4. vol. i. p. 297.—Lindley, Synopsis, p. 152.

Root fleshy, branched. *Stem* erect, about four feet high, stout,



1238

Carduus Marianus



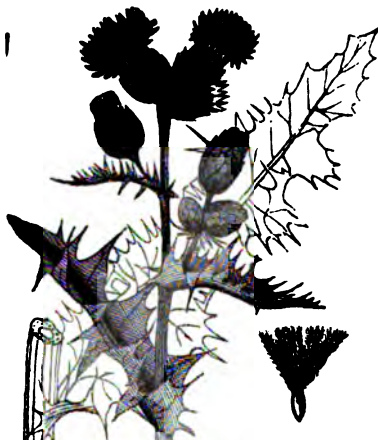
1239

Cirsium lanceolatum.



1240

Cirsium palustre.



1241

Cirsium arvense,



1242

Cirsium eriophorum.



1243

Cirsium bulbosum.

branched, angular, furrowed, leafy, hairy or downy. *Leaves* lanceolate, hispid, or hairy on the upper side, white and cottony beneath, deeply lobed in a pinnatifid manner, the lobes spreading, often cut in a somewhat palmate manner, spinous. *Flowers* large, crimson, solitary and terminal, and sometimes with one or two lateral ones. *Involucre* woolly, ovate, scales lanceolate, with a spiny point, spreading. *Florets* tubular, the limb of five linear segments. *Fruit* polished, ovate, compressed, brown. *Pappus* feathery, united at the base into a ring.

Habitat.—Road sides and pastures; frequent.

Biennial; flowering in July and August.

2. *C. palustre*, Scop. (Fig. 1240.) *Marsh Plume-thistle*. Leaves decurrent, pinnatifid, spinous, rough, their segments generally two lobed, spreading; involucre ovate, downy, its scales ovate lanceolate, mucronate, appressed; heads numerous, clustered.

De Cand. Prod. 6. p. 645.—*Carduus palustris*, Linn.—English Botany, t. 974.—*Cnicus*, p., Willd.—English Flora, vol. iii. p. 389.—Hooker, British Flora, ed. 4. vol. i. p. 297.—Lindley, Synopsis, p. 152.

Root fleshy, branching. *Stem* erect, simple, or somewhat branched upwards, striated, furrowed, angular, from three to six feet high, downy, interruptedly winged, and furnished with numberless fine pungent spines. *Leaves* numerous, long, narrow, linear lanceolate, roughish above, pale and downy beneath, sinuated in a pinnatifid manner, the lobes bifid, or palmate, ciliated with numerous small and larger hard horny pungent spines. *Flowers* dark crimson, purple or white, sessile, numerous, crowded at the end of the stem and branches. *Involucre* ovate, downy, its scales ovate lanceolate, keeled, and with a bristle-shaped point, the upper part of the scale often purple. *Florets* tubular, the limb divided into five linear segments. *Fruit* smooth, ovate, pale brown. *Pappus* of long feathery silky rays, united into a ring at the base.

Habitat.—Moist meadows, pastures, and shady places; frequent.

Biennial; flowering in July.

** *Leaves sessile, or nearly so.*

3. *C. arvensis*, Scop. (Fig. 1241.) *Creeping Plume-thistle*. Leaves sessile, oblong lanceolate, pinnatifid, spinuloso-ciliated; stem paniculated; heads ovate; involucre scales appressed, ovate lanceolate, mucronate; root creeping.

De Cand. Prod. 6. p. 643.—*Carduus arvensis*, Smith.—English Botany, t. 975.—*Cnicus*, a., Hoffm.—English Flora, vol. iii. p. 390.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Root fibrous, with long creeping underground stems. *Stem* erect,

three to four feet high, branched, angular, furrowed, not winged, smooth, or somewhat downy. *Leaves* numerous, smooth, or somewhat downy, lanceolate, sessile, ciliated with small spines, intermixed with larger ones, the upper leaves narrow, waved, the lower oblong, sinuated in a pinnatifid manner. *Flowers* numerous, small, pale purple or white, terminating the stem and branches in a paniculated manner. *Involucre* ovate, smooth or downy, the scales close pressed, the outer ones small, ovate lanceolate, with a bristle point, the upper ones linear lanceolate, much longer. *Florets* tubular, the limb deeply cut into narrow segments. *Fruit* ovate, compressed, pale brown. *Pappus* very long, soft, silky, feathery, elegant.

Habitat.—Fields and road sides; very common.

Perennial; flowering in July.

This very common species is, from its extensively creeping underground stems, (a portion of which, not more than an inch long, if left in the ground, puts out roots and stems, and is the parent of another large Colony), extremely difficult to extirpate from the situations in which it has established itself; for not only by its roots does it propagate itself, but by the abundant seed which it produces. Sometimes in the axis of the leaves gall nuts are produced, which are said to be powerfully astringent, and useful in restraining hæmorrhages, as are the common nut galls, and some other astringents; but to be useful they must be applied in a more effectual way than by carrying them in the pockets, as was recommended by the old wives in former days.

4. *C. Forsteri*, *Smith*. *Branching Bog Plumethistle*. "Leaves slightly decurrent, pinnatifid, spinous, downy beneath; stem panicled, hollow; involucre ovate, rather cottony, outer scales spinous."

Cnicus.—English Flora, vol. iii. p. 391.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Habitat.—Boggy woods; formerly found near Frant, Sussex, two miles from Tunbridge Wells; foot of St. George's Hill, Weybridge; Gareagh, Derry.—*Mr. D. Moore*.

Perennial; flowering in July and August.

"The fructification of this plant most accords with that of the two last species, while the herbage and habit approach some of the following, or rather the exotic *Cnicus rivularis*, Willd., though very distinct from that, and as far as I have been able to determine from all other described species."—*Smith*. Mr. Borrer suspects it to be a hybrid produced between *C. pratensis* and *C. palustris*.

5. *C. eriophorum*, *Scop*. (Fig. 1242.) *Woolly-headed Plumethistle*. Leaves sessile, pinnatifid, rough above, cottony beneath, every other segment pointed upwards, spinous; involucre spherical, woolly, its scales lanceolate, dilated at the end, and spinous.

De Cand. Prod. 6. p. 638.—*Carduus eriophorus*, Linn.—English Botany, t. 386.—*Cnicus*.—English Flora, vol. iii. p. 391.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Root tapering. *Stem* erect, three feet high, much branched and spreading, leafy, round, deeply furrowed, somewhat hairy. *Leaves* numerous, sessile, large, spreading, rough above, white and cottony beneath, deeply pinnatifid, the lobes bifid, the lacene lanceolate, entire, alternately pointing upwards, tipped with a strong spine. *Flowers* large, terminal, solitary, purple. *Involucre* large, globose, very woolly, with one or two small leaves close beneath, the scales like a mass of wool at the base, the points only protruding, lanceolate, with a spinous point, spreading, purplish. *Florets* long, tubular, the limb cut into five narrow segments. *Fruit* obovate, smooth. *Pappus* long, silky, feathery.

Habitat—Waste ground and road sides, especially in a gravelly or limestone soil. Rare in Scotland; near Edinburgh, Dunbarton, and in Appin.

Biennial; flowering in July.

This is remarkable, from its large size and widely spreading habit; the root leaves are often two feet long, and are peculiarly exact in the pointing upwards and downwards of their alternate lobes. The flowers are very large, and sometimes white.

6. *C. bulbo'sum*, De Cand. (Fig. 1243) *Bulbous Plume-thistle*. Leaves deeply pinnatifid and toothed, hairy above, woolly beneath, the lower ones petiolated; stem above the middle, leafless, one or few flowered; peduncles elongated; involucre sub-globose, nearly smooth, its scales lanceolate, mucronate, spreading at the points; root fasciculated.

De Cand. Prod. 6. p. 650.—*Cnicus tuberosus*, Willd.—English Botany, t. 2562.—English Flora, vol. iii. p. 392.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Root hard and woody, putting out numerous radicles, swollen into fleshy oblong tubers. *Stem* erect, about two feet high, simple, or slightly branched upwards, round, woolly, furrowed, leafy in the lower part, wand-like above. *Leaves* lanceolate, green and hairy on the upper side, pale and cottony on the under, all deeply pinnatifid, the lobes divided into narrow lanceolate segments, all fringed with fine prickles, and pointed with strong spines, the lower leaves on foot-stalks, the upper sessile. *Flowers* terminal, solitary, mostly single, seldom more than three on a plant, bright purple. *Involucre* globose, or oblong, nearly smooth, the scales lanceolate, the outer ones bristle pointed, all close pressed, except the points, which are spreading. *Florets* tubular, the limb cut into fine narrow segments. *Fruit* obovate, smooth, small. *Pappus* long, silky, feathery.

Habitat.—In a copse-wood, called Great Ridge, on the Wiltshire Downs, between Boyton House and Fonthill, abundantly.—*A. B. Lambert, Esq.*

Perennial; flowering in August.

A very distinct species, with remarkable pinnated leaves, and large handsome purple flowers. It is more frequent on the Continent than with us.

7. *C. heterophyllum*, *Allion*. (Fig. 1244.) *Melancholy Plume-thistle*. Leaves nearly smooth above, white and woolly beneath, elliptic lanceolate, acuminate, the upper semi-amplexicaul, entire, ciliated with spines, the lower petiolated, toothed and ciliated; stem leafy, one to three flowered, solitary; involucre ovate, of close pressed lanceolate scales.

De Cand. Prod. 6. p. 653.—*Carduus heterophyllus*, Linn.—English Botany, t. 675.—*Cnicus hetero*.—English Flora, vol. iii. p. 393.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Root with creeping underground stems. *Stems* erect, about three feet high, round, striated, white, with cottony down, simple, and terminating in a single flower, or divided above, and bearing two or three flowers. *Leaves* lanceolate, or elliptic-lanceolate, acuminate, pliant, green above, and slightly downy, white and woolly beneath, the upper leaves sessile, semi-amplexicaul, entire, the margin ciliated with slender spines, the lower leaves large, tapering into a winged footstalk, toothed or lobed, and ciliated with slender spines. *Flowers* large, handsome, purple, solitary, on a long slender round peduncle. *Involucre* oblong, smooth, or nearly so, its scales lanceolate, taper pointed, close pressed. *Florets* long, tubular, the limb deeply cut into long narrow segments. *Fruit* ovate. *Pappus* of long silky slender rays, that of the marginal seeds mostly only rough, of the rest feathery, very elegant.

Habitat.—Moist mountainous pastures, especially in the North.

Perennial; flowering in July.

8. *C. Anglicum*, *Raii*. (Fig. 1245.) *English Plume thistle*. Leaves nearly smooth above, loosely woolly beneath, oblong lanceolate, acute, unequally waved or sinuated, and ciliated with spines, the upper amplexicaul, the lower petiolated; stem single flowered, naked above; involucre ovate, of close pressed lanceolate mucronated scales.

De Cand. Prod. 6. p. 650.—*Carduus pratensis*, Jacq.—English Botany, t. 177.—*Cnicus pratensis*, Willd.—English Flora, vol. iii. p. 394.—Hooker, British Flora, ed. 4. vol. i. p. 298.—Lindley, Synopsis, p. 153.

Root of several fleshy fibres. *Stem* erect, from one to two feet high, round, furrowed, simple, clothed with white cottony pubescence.





1244

Cirsium heterophyllum.



1245

Cirsium anglicum.



1246.

Cirsium acaule.



1247

Lappa major.



1248

Serratula tinctoria.



1249

Saussurea alvina.

Leaves not very numerous, lanceolate, green, and slightly downy above, loosely cottony beneath, toothed, waved, or sinuated in an unequal manner, and ciliated with unequal sharp spines, the upper ones sessile, and embracing the stem, the lower ones petiolated. *Flower* smaller than the last species, a fine purple, solitary. *Involucre* ovate, smooth, or loosely webbed over, the outer scales ovate, tapering into a spinous point, the inner ones longer, narrower, and scarcely spinous, coloured. *Florets* longer, tubular, the limb cut into narrow linear segments. *Fruit* ovate. *Pappus* white, silky, feathery.

Habitat.—Low wet pastures, especially among trees; rare in Scotland; Isla and Arran.

Perennial; flowering in June and July.

The two last are very elegant plants, from their round slender white woolly naked peduncles bearing a terminal rich purple flower, and the beautiful leaves bright shining green above, and white beneath. They are plants well suited for ornamental rock work in shady damp places.

9. *C. acaule*, All. (Fig. 1246.) *Dwarf Plume-thistle*. Leaves smooth, lanceolate, sinuato-pinnatifid, ciliated with spines; stemless; involucre oblong, smooth, its scales ovate lanceolate, the outer ones with a spinous point.

De Cand. Prod. 6. p. 652.—*Carduus acaulis*, Linn.—English Botany, t. 161.—*Cnicus acaulis*, Willd.—English Flora, vol. iii. p. 395.—Hooker, British Flora, ed. 4. vol. i. p. 299.—Lindley, Synopsis, p. 153.

Root stout, woody, tapering, long. *Leaves* numerous, oblong, lanceolate, deeply and unequally lobed and sinuated in a pinnatifid manner, toothed and ciliated with slender spines, a shining green above, pale beneath, covered over with a loose cobweb-like down, all petiolated, spreading close to the ground, and from the midst of these arises a solitary head, sessile, or on a short stalk, thickly clothed with leaves, the *involucre* oblong, cylindrical, smooth, the scales green, outer ones ovate lanceolate, fringed on the margin, the mid-rib terminating in a short slender spine, the upper scales lanceolate, linear, smooth, acutely pointed. *Flower* purple. *Florets* long, tubular, the limb cut into narrow linear segments. *Fruit* ovate, smooth, pale brown, compressed. *Pappus* long, silky, feathery.

Habitat.—Pastures and meadows in a dry gravelly or chalky soil; not unfrequent; rare in Scotland.

Perennial; flowering in June and July.

The numerous long leaves of this plant spreading close to the ground smother all other plants beneath it, and in some pastures where it grows abundantly it is extremely injurious. When the

plant is removed from the poor soil in which it grows into a richer one, it puts out a stem several inches high, and often then bears several heads of flowers.

GENUS XX. LAP'PA.—TOURN. *Burdock*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* globose, imbricated, the scales spinous, the apex recurved into a hook. *Receptacle* paleaceous. *Pappus* short, of rigid unequal hairs.—Name from *lap*, a hand in Celtic; so called from the hooks of the involucre catching hold of every thing near it.

1. *L. ma'jor*, Gærtn. (Fig. 1247.) *Common Burdock*. Leaves cordate, petiolated; involucre scales smooth.

L. glabra, Lam.—Lindley, Synopsis, p. 154.—*Arctium Lappa*, Linn.—English Botany, t. 2478.—English Flora, vol. iii. p. 381.—Hooker, British Flora, ed. 4. vol. i. p. 296.

β. tomentosa. Involucre scales with a cob web like down.

L. tomentosa, Lam.—Lindley, Synopsis, p. 154.—*A. Badana*, Willd.—English Botany, t. 2478.—English Flora, vol. iii. p. 382.—*A. lappa, β.*—Hooker, British Flora, ed. 4. vol. i. p. 296.

Root tapering, fleshy. *Stem* erect, about three feet high, striated, furrowed much, and spreading. *Leaves* numerous, broadly heart-shaped, waved, petiolated, and three ribbed at the base, white, with short close down on the under side, green, and nearly smooth above. *Flowers* numerous, solitary on the end of the branches, or several arranged in a sub-corymbose or racemose manner. *Florets* few, purple, tubular, the limb cut into five narrow segments. *Involucre* globose, of numerous awl-shaped spreading scales, slender, triangular, and hooked at the apex, smooth, or interwoven with a cob-web like down. *Fruit* abrupt, four angled, obovate, crowned with short rough *pappus*.

Habitat.—Waste places, road sides, &c.; frequent.

Biennial; flowering in August.

The Burdock is well known to every one who has resided in the country, and is a large cumbersome looking rough plant. It is rarely browsed, except by the ass, snails, and some kinds of caterpillars eat it. In the North of Europe its young roots and tender shoots are used as pot-herbs, and the stems stripped of their rind before the flowers appear, are eaten raw with oil or vinegar, or boiled as a substitute of the more delicate asparagus. The roots and seeds have been used in medicine as diuretic and sudorific, it is said, with advantage in scurvy, gouty, and rheumatic affections, and diseases of

the kidneys. In France it is used as an expectorant, and its roots are said to be equal to sarsaparilla.

The seeds enveloped amidst the closely investing hard scales of the involucre seem as though they never could escape, but nature has so contrived, by means of the hardened hook at the end of the scales, that they shall cling and hold so fast to the coats of animals, &c., that to separate them is to pull them to pieces, and thus allow the seeds to escape and sow themselves! The green plant, when burned, furnishes a large proportion of alkaline salt, which is the best kind of dressing for land. Thus we find a large cumbersome useless looking weed is applied to many useful purposes, and when destroyed by fire, its ashes furnish a valuable substance for the nutriment of plants. This constant interchange of particles arranged under various combinations is one of the most interesting circumstances in the whole system of nature; it is the most wonderful, and should excite the greatest astonishment in the power of that Being who has thus arranged the universe, and it must be a most salutary lesson to the proud man to think that the particles of his body must, like those of this weed, be changed into other substances, as they have been before they were packed together to form his body. Let us, however, ponder over these changes, and

“ Thus deeply drinking in the soul of things,
We shall be wise per force; and while inspired
By choice, and conscious that the will is free,
Unswerving shall we move, as if impelled
By strict necessity, along the path
Of order and of good. Whate’er we see,
Whate’er we feel, by agency direct
Or indirect shall tend to feed and nurse
Our faculties, shall fix in calmer seats
Of moral strength, and raise to loftier heights
Of love divine our intellectual soul.”

Wordsworth.

GENUS XXI. SERRAT'ULA.—LINN. *Saw-wort.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involuorum* oblong, imbricated, the scales unarmed, acute. *Receptacle* paleaceous, the scales mostly cut into numerous linear bristles. *Pappus* persistent, of unequal rigid scales. Named *serrula*, a little *saw*, from the fine saw-like serratures of the leaves.

1. *S. tinctoria*, Linn. (Fig. 1248.) *Common Saw-wort.* Leaves acutely serrated, lyrato-pinnatifid, the terminal lobe lanceolate; heads

oblong, corymbose; involucre scales appressed, the outer ovate, acute, the inner linear.

English Botany, t. 38.—English Flora, vol. iii. p. 383.—Hooker, British Flora, ed. 4. vol. i. p. 207.—Lindley, Synopsis, p. 154.

Root somewhat woody. *Stem* erect, simple, from two to three feet high, striated, angular, furrowed, leafy, smooth, or rather downy. *Leaves* smooth, with a little downiness, dark green above, paler beneath, finely and acutely serrated on the margin, lyrato-pinnatifid, the lateral lobes narrow, the terminal one long, narrow, lanceolate. *Flowers* several, terminating the stem in a corymbose cluster, the peduncles short, or elongated. *Involucre* oblong, its scales dark purple, the outer ones ovate lanceolate, the inner linear, all close pressed, more or less distinctly ribbed and downy, especially upon the margin. *Florets* tubular, purplish crimson, the limb cut into linear segments. *Fruit* ovate, compressed. *Pappus* short, rough, dirty white hairs, of unequal lengths. *Receptacle* with numerous bristly hairs, longer than the seeds.

Habitat.—Thickets and pastures.

Perennial, flowering in July and August.

The leaves are sometimes found quite entire, and of an ovate lanceolate form. The whole plant is said to dye woollen goods of a fine yellow colour, for which purpose Linnæus says it is much used in Sweden; and when fixed with alum, it is reported to be a more permanent and beautiful yellow colour, and to give a better green when mixed with blue, than either *Reseda Luteola* or *Genista tinctoria*.

GENUS XXII. SAUSSUREA.—DE CAND. *Saussurea*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* oblong, imbricated, the scales unarmed. *Receptacle* paleaceous, or bristly. *Pappus* in two rows, the outer of short minutely notched hairs, the inner feathery, and longer.—Named in honour of the two Saussures, father and son, two Swiss philosophers.

1. *S. alpina*, De Cand. (Fig. 1249.) *Alpine Saussurea*. Leaves toothed, smooth above, cottony beneath, the radical ones petiolated, ovate lanceolate, rounded at the base, those of the stem lanceolate, the upper ones sessile, heads in a crowded umbel, terminal.

Hooker, British Flora, ed. 4. vol. i. p. 296.—Lindley, Synopsis, p. 152.—*Serratula alpina*, Linn.—English Botany, t. 599.—English Flora, vol. iii. p. 384.

Root somewhat woody. *Stem* erect, simple, round, striated, woolly, from six to twelve inches high. *Leaves* numerous, unequally toothed

on the margin, smooth, and dark green above, pale and cottony beneath, the lower ones ovate, lanceolate, rounded or heart-shaped at the base, with a long footstalk, the upper ones oblong, lanceolate, nearly sessile, the upper most sessile. *Flowers* not very numerous, in a terminal sub-umbellate crowded cluster. *Involucre* oblong, downy, purple, the outer ones short, ovate, acute, the inner linear, all close pressed. *Florets* tubular, purple, the limb cut into five lobes. *Anthers* purple. *Fruit* ovate, compressed. *Pappus* of long silky feathery rays. *Receptacle* with narrow lanceolate scales.

Habitat.—Moist alpine rocks; frequent on the Highland Mountains of Scotland, Snowden.

Perennial; flowering in August.

GENUS XXIII. EUPATO'RIMUM.—LINN. *Hemp-agrimony*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* oblong, cylindrical, imbricated, with ovate oblong scales. *Florets* few. *Style* much elongated. *Receptacle* naked. *Pappus* hairy.—Named from *Eupator*, the surname of Mithridates, King of Pontus, who brought the plant into use.

1. *E. cannabinum*, Linn. (Fig. 1250.) *Common Hemp-agrimony*. Leaves opposite, sub-petiolated, three or five partite, their segments lanceolate, deeply serrated, the middle one longest.

English Botany, t. 428.—English Flora, vol. iii. p. 401.—Hooker, British Flora, ed. 4. vol i. p. 300.—Lindley, Synopsis, p. 142.

Root with very long fibres, somewhat creeping. *Stems* mostly several, three to four feet high, erect, round, striated, branched, leafy, downy, mostly of a brown or purple colour on one side. *Leaves* finely downy, dark green above, paler beneath, opposite with short petioles, three or five partite, the segments lanceolate, deeply and unequally toothed, the middle lobe the largest. *Flowers* very numerous, small, pale pink or purplish, in crowded corymbose tufts, terminating the stem and branches. *Involucre* oblong, cylindrical, smooth, the scales imbricated, the outer ones small, ovate lanceolate, the inner ones linear oblong, thin, membranous on the margin. *Florets* about six, tubular, the limb in five short lobes. *Fruit* compressed, oblong. *Pappus* dirty white, of roughish hairs.

Habitat.—Watery and boggy places; frequent.

Perennial; flowering in July and August.

GENUS XXIV. PETASITES.—Desf. *Butter-bur*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN CHAR. *Involucrum* of two rows of lanceolate scales. *Florets* all perfect, or the central ones perfect, and those of the rays with pistils only. *Receptacle* naked. *Pappus* hairy.—Name *πεταρος*, a covering to the head, or umbrella, from the great size of the leaves, the largest of any of our herbaceous plants.

1. *P. vulgaris*, Desf. (Fig. 1251.) *Common Butter-bur*. Leaves cordate, unequally toothed, downy beneath; lobes at the base rounded; flowers in a dense oblong thyrus; stigma of the perfect flowers short, ovate.

Hooker, British Flora, ed. 4. vol. i. p. 303.—English Flora, vol. iii. p. 427.—Lindley, Synopsis, p. 147.

α. Flowers sterile, bearing anthers, rarely pistils, and seed.—*Tussilago Petasites*, Linn.—English Botany, t. 434.

β. Flowers fertile, bearing seed, rarely stamens.

T. hybrida. English Botany, t. 430.

Root fleshy, with long creeping underground stems. *Leaves* numerous, very large, often a yard in diameter, of a rounded heart-shaped figure, the lobes round, cut to the base of the lateral ribs, unequally toothed on the margin, green and smooth above, pale and cottony beneath, the ribs stout, prominent, the footstalk long, stout, channeled, dilated and sheathing at the base. *Flower stalk* erect, about a foot high, round, white, with down, scattered over with short footstalks, bearing rudiments of leaves in the lower part of the stem, in the upper they are simple lanceolate bractea. *Inflorescence* an oblong crowded thyrus, of numerous heads, on short stalks, from the axis of linear bractea. *Involucre* two rows of lanceolate obtuse scales, three ribbed, and somewhat downy. *Florets* tubular, five cleft, pink, bearing stamens only or pistils only, or both in the same floret. *Fruit* ovate. *Pappus* white silky hairs.

Habitat.—Moist meadows, banks of rivers, drains, &c.; frequent.

Perennial; flowering in April and May before the leaves are expanded.

The roots of this plant have been recommended as an aperient anti-pestilential and sudorific, and have been applied externally to malignant "sores and ulcers." They have a strong somewhat aromatic smell and bitter acrid taste; their use as a medicine now however, is entirely neglected. It is planted by the Swedish farmers near their bee hives, as this species, with *P. alba* and *fragrans*, are amongst the earliest of our spring flowers, and are largely resorted to by the bees on fine sunny days.



1250

Eupatorium cannabinum.



1251

Petasites vulgaris.



1252

Chrysocoma Linosyris.



1253

Filago Gallica.



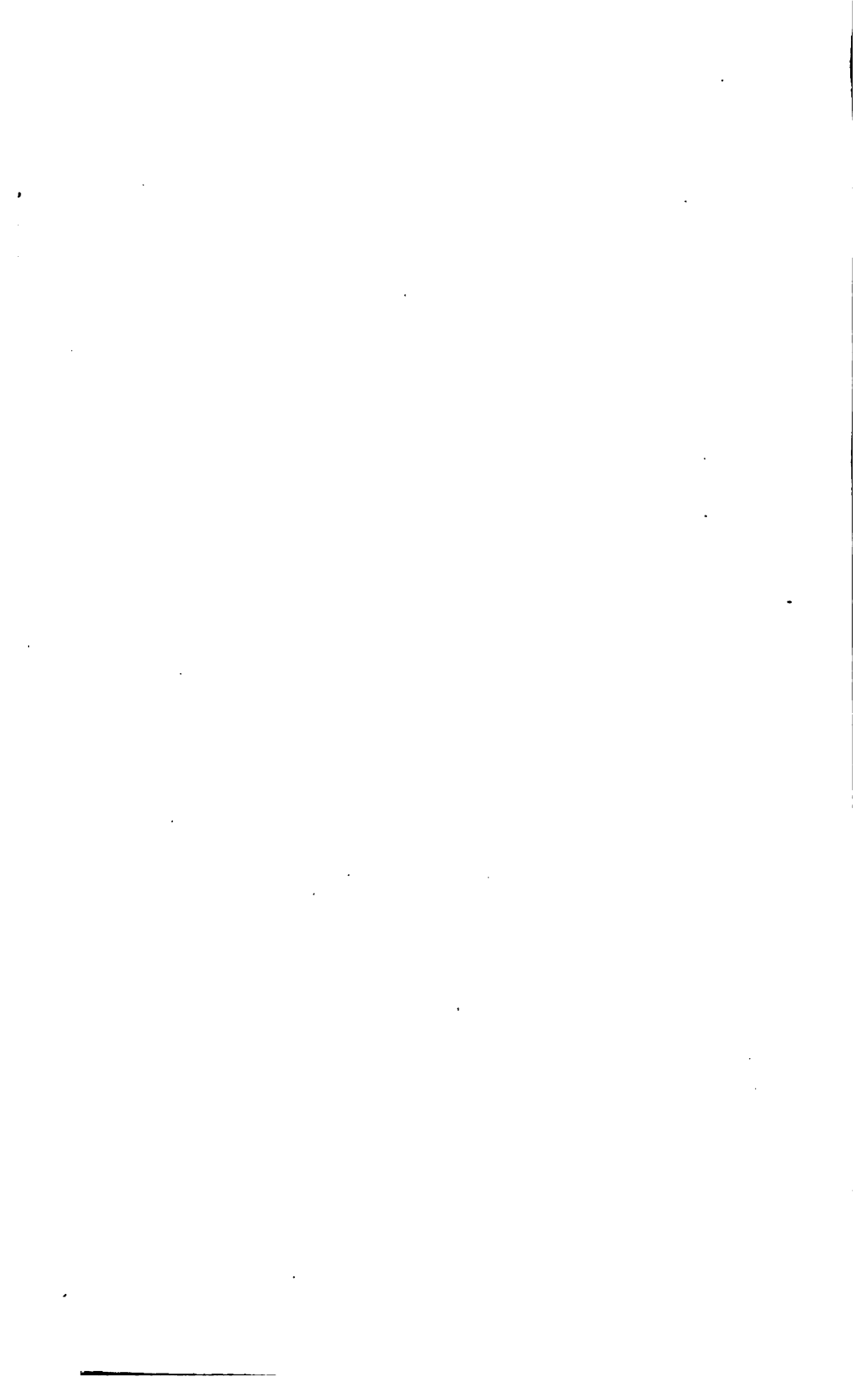
1254

Filago minima.



1255

Filago Germanica.



GENUS XXV. CHRYSOCOMA.—LINN. *Goldylocks.*

Nat. Ord. COMPOSITE. JUSS.

GEN. CHAR. *Involucrum* imbricated hæmispherical, or ovate, the scales linear. *Florets* all perfect and tubular. *Receptacle* excavated, naked. *Pappus* hairy, rough, or ciliated.—Name from *χρυσός*, *gold*; and *κωμή*, *hair*; in allusion to the tuft of yellow flowers, with which the stem with its many narrow hair-like leaves are terminated.

1. *C. Linosyris*, Linn. (Fig. 1252.) *Flax-leaved Goldylocks.* Herbaceous leaves linear, smooth; involucre scales loosely spreading.

English Botany, t. 2505.—English Flora, vol. iii. p. 402.—Lindley, Synopsis, p. 142.—*Linosyris vulgaris*.—Hooker, British Flora, ed. 4. vol. i. p. 300.

Root fibrous, creeping. *Stem* erect, herbaceous, smooth, about a foot high, leafy, round, simple, slender. *Leaves* scattered, numerous, linear, acute, smooth, spreading from one to two inches long, somewhat fleshy. *Flowers* bright yellow, not very numerous, terminating the stem in a close tuft, or branched in a sub-corymbose manner. *Florets* tubular, deeply cut into five linear acute segments. *Involucres* smooth, or slightly downy, lanceolate, spreading. *Fruit* obovate, compressed, rough, with short hairs. *Pappus* dirty white, rough.

Habitat.—Rocky cliffs near the sea; rare. Berryhead, Devon; Whorle-hill, Weston-Super-Mare, Somerset; Ormeshead, and between Brighton and Shoreham.

Perennial; flowering in August and September.

This, though a rare plant with us, is not uncommon on the Continent, and especially in Italy, growing there many miles from the sea. We have seen it in great abundance on the hill side near Volterra and the neighbourhood.

GENUS XXVI. FILAGO.—LINN. *Filago.*

Nat. Ord. COMPOSITE. JUSS.

GEN. CHAR. *Involucrum* imbricated, scales equal, acuminate, the margin membranous, coloured, longer than the florets. *Florets* slender, tubular, those of the disk perfect on the circumference with pistils only. *Receptacle* conical, toothed, tuberculated, or paleaceous. *Pappus* hairy, often wanting.—Name *filum*, *thread*; so called from the plants being covered over with slender thread-like hairs.

1. *F. Gal'lica*, Linn. (Fig. 1253.) *Narrow-leaved Filago.* White, with woolly pubescence; stem erect, dichotomous; leaves linear,

acuminate, spreading; heads of flowers loosely glomerate, terminal and axillary, much shorter than the leaves; involucre scales downy, with a smooth membranous obtuse point.

Hooker, British Flora, ed. 4, vol. i. p. 302.—Lindley, Synopsis, p. 145.—*Gnaphalium gallicum*, Huds.—English Botany, t. 2369.—English Flora, vol. iii. p. 418.

Root small, tapering. *Stem* single, or several, about six inches high, erect, round, slender, white, like the rest of the plant, with a covering of silky hairs, simple below, branched above in a forked manner into several subdivisions. *Leaves* numerous, linear, taper pointed, about an inch long, erect, or slightly spreading. *Heads* of flowers small, several crowded together into globose clusters in the axis of the branches and leaves, and also terminal, much shorter than the leaves. *Involucre* scales lanceolate, acute, downy, with a membranous margin, erect, close pressed. *Florets* tubular, five cleft, pale straw colour. *Fruit* somewhat kidney shaped, clothed with cottony down. *Pappus* rough. *Receptacle* tuberculated, exposed after the escape of the fruit

Habitat.—Dry gravelly or sandy soil; not common. Essex, Kent Derbyshire, Nottinghamshire; near Forfar, and Newburgh, Fifeshire, Scotland.

Annual; flowering in July and August.

2. *F. minima*, Fries. (Fig. 1254.) *Least Filago*. White, with woolly pubescence; stem erect, branched, its branches dichotomous; leaves short, lanceolate, close pressed; heads of flowers glomerate, terminal and axillary, longer than the leaves; involucre scales downy, with a smooth membranous obtuse point.

Hooker, British Flora, ed. 4, vol. i. p. 302.—Lindley, Synopsis, p. 145.—*Gnaphalium minimum*, Smith.—English Botany, t. 1157.—English Flora, vol. iii. p. 418.—*G. montanum*, Huds.

Root small, fibrous. *Stem* erect, slender, round, from three to six inches high, white, with cottony pubescence, as is the rest of the plant, single or several, simple below, branched at the top, the branches simple, or forked, and spreading. *Leaves* scattered, erect, lanceolate, about half an inch long, numerous, sessile. *Heads* of flowers small, conical, numerous, crowded into globose clusters at the ends and axis of the branches. *Involucre* scales lanceolate, obtuse, downy, with a membranous point. *Florets* tubular, yellow, the limb five cleft. *Fruit* small, ovate, downy. *Pappus* of rough bristly hairs. *Receptacle* small, tuberculated, exposed after the fruit is ripe.

Habitat.—Dry gravelly and sandy places; frequent.

Annual; flowering in July and August.

This is a smaller plant than the last, and is readily distinguished by its short erect leaves, and the globose heads of flowers longer than the leaves. The panicle is smaller, and less divided.

3. *F. German'ica*, Linn. (Fig. 1255.) *Common Filago*. White, with woolly pubescence; stem erect, proliferous at the summit; leaves lanceolate, acute; heads of flowers numerous, densely glomerate, terminal, and in the axis of the branches; involucre scales membranous, lanceolate, bristle pointed.

Hooker, British Flora, ed. 4. vol. i. p. 302.—Lindley, Synopsis, p. 145.—*Gnaphalium germanicum*, Huds.—English Botany, t. 946.—English Flora, p. 419.

Root small, fibrous. *Stems* one or more erect, six to eighteen inches high, round, white, with soft woolliness, like the rest of the plant, simple, leafy. *Leaves* very numerous, scattered, lanceolate, acute, wavy, sessile, embracing the stem, erect, bearing at the top numerous crowded heads of flowers in a globular form as large as a marble, and from beneath this spring one, two, or several branches, each terminating in the same globose collection of heads and branches, and often these branches again terminate in the same way. *Involucre* of smooth membranous lanceolate bristle-pointed scales, erect. *Florets* small, tubular, yellow, the limb five cleft. *Fruit* small, downy. *Pappus* rough. *Receptacle* small, tuberculated, exposed after the fruit has fallen.

Habitat.—Fields, pastures, and waste places; common.

Annual; flowering in July and August.

GENUS XXVII. GNAPHA'LIIUM.—LINN. *Cudweed*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, scales unequal, obtuse, membranous, coloured, as long as the florets. *Florets* slender, tubular, those of the disk perfect on the circumference, with pistils only. *Receptacle* flat, naked. *Pappus* hairy, often thickened upwards.—Name γναφαλον, *soft down*, or *wool*: in reference to the clothing of the leaves.

* *Flowers* dioecious (*Antennaria*, Brown.).

1. *G. dioicum*, Linn. (Fig. 1256.) *Mountain Cudweed*. Stolons prostrate, rooting; stem simple; leaves nearly smooth above, white and woolly beneath, the radical ones spatulate, the upper linear; flowers dioecious; corymb terminal; involucre scales smooth, coloured, obtuse, elongated.

English Botany, t. 267.—English Flora, vol. iii. p. 414.—Hooker, British Flora, ed. 4. vol. i. p. 301.—*Antennaria dioica*,] Gærtn.—Lindley, Synopsis.

β. *hyperboreum*. (Fig. 1257.) Leaves woolly on both sides.

Antennaria hyperborea, Don.—English Botany, Suppl. t. 2640. Lindley, Synopsis, p. 325.

Root small, fibrous. *Stem* erect, solitary, simple, from two to eight inches high, round, clothed with soft woolliness, leafy, mostly having at the base several prostrate stolons, by which the plant is increased. *Leaves* green, and nearly smooth above, white, with woolliness beneath, the radical ones numerous, spatulate, the mid-rib terminating in a bristly point, those of the stem linear, erect. *Heads* of flowers numerous, white, pale pink, or rose colour, everlasting, terminating the stem in a crowded corymb. *Florets* numerous, tubular, five cleft, the florets of one plant bear anthers only, those of another only pistils. *Involucre* scales imbricated, the outer ones short and downy, the inner linear, obtuse, membranous, often coloured, longer than the florets, and forming a ray to each head. *Fruit* mostly imperfect. *Pappus* of long rough often feathery hairs.

Habitat.—Mountain heaths, abundant; β . Isle of Skye.

Perennial; flowering in June and July.

This is a very elegant little plant, variable in size and luxuriance and in the colour of its flowers. It is easy of cultivation, and on rock work or dry borders forms pretty patches, and remains in flower a long time.

2. *G. margarita'ceum*, Linn. (Fig. 1258.) *American Cudweed, Pearly Everlasting*. Stem erect, herbaceous, branched above; flowers corymbose; leaves linear lanceolate, acuminate, cottony, especially beneath.

English Botany, t. 2018.—English Flora, vol. iii p. 418.—Hooker, British Flora, ed. 4. vol. i. p. 301.—*Antennaria margari*.—Lindley, Synopsis, p. 144.

Root somewhat creeping. *Stem* erect, about two feet high, leafy, and thickly clothed with cottony pubescence. *Leaves* alternate, linear lanceolate, acuminate, green, and slightly cottony above, white, and thickly clothed with woolliness beneath. *Inflorescence* corymbose, terminating the stem and branches. *Flowers* numerous. *Involucre* globose, of numerous pearly white lanceolate scales, persistent, and remaining unchanged after flowering. *Florets* numerous, tubular, yellow, the limb five cleft. *Fruit* ovate. *Pappus* rough simple hairs. *Receptacle* tuberculated.

Habitat.—Moist meadows, rare. Near Bocking, Essex; banks of Rymny river, South Wales, and near Dalgelly, Merionethshire; Wire Forest, Worcestershire; and Longdon, near Lichfield; Jersey and Guernsey.

Perennial; flowering in August.

**** Flowers perfect.**

3. *G. luteo-album*. Linn. (Fig. 1259.) *Jersey Cudweed*. Stem erect, herbaceous, simple; flowers densely tufted; leaves lanceolate, cottony on both sides, semi-amplexicaul, the lower ones obtuse; fruit slightly tuberculated.



1256 *Gnaphalium dioicum.*



1257 *Gnaphalium dioicum. β.*



1258 *Gnaphalium margaritaceum.*



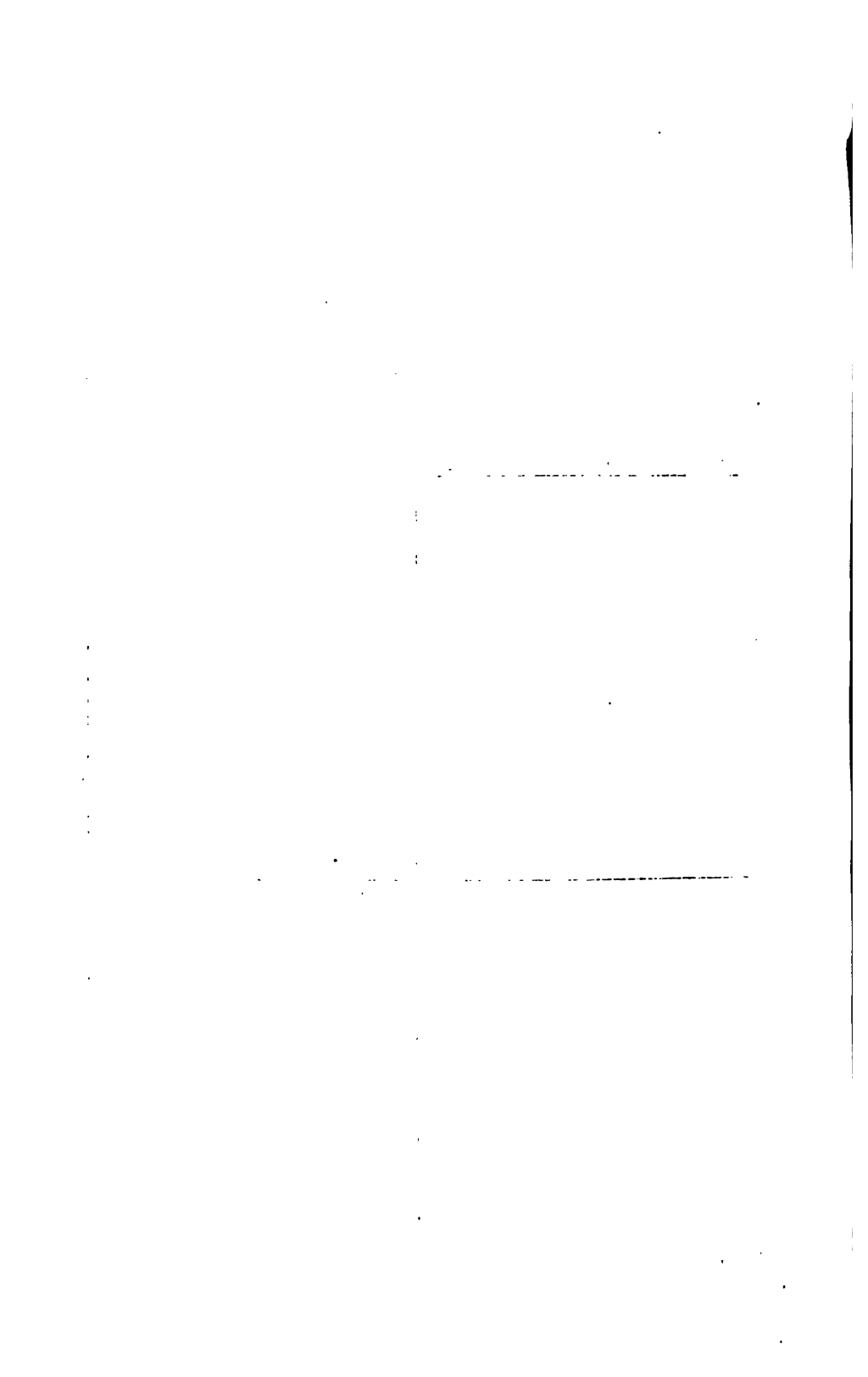
1259 *Gnaphalium luteo album.*



1260 *Gnaphalium sylvaticum.*



1261 *Gnaphalium leptum.*



English Botany, t. 1002.—English Flora, vol. iii. p. 412.—Hooker, British Flora, ed. 4. vol. i. p. 301.—Lindley, Synopsis, p. 145.

Root small, fibrous. *Stems* erect, mostly several, from six to twelve inches high, simple, rarely branched above, mostly curved at the base, clothed like the rest of the plant with a thick cottony covering. *Leaves* numerous, alternate, sessile, half embracing the stem, lanceolate, waved, the upper ones acutely pointed, the lower obtuse. *Inflorescence* corymbose, terminating the stem and branches. *Flowers* numerous, crowded. *Involucre* ovate, its scales a delicate shining pale yellow, persistent, everlasting, ovate oblong. *Florets* numerous, tubular, the outer ones often reddish, the central ones yellow. *Fruit* ovate, somewhat tuberculated. *Pappus* of simple rough hairs. *Receptacle* tuberculated, exposed after the fruit has fallen.

Habitat.—Dry sandy ground. Jersey; between Hanxton and Little Shelford, Cambridgeshire; fields at Laringford, Norfolk.

Annual; flowering in July and August.

We find frequent allusion in the earlier records of the Greeks to the practice of paying respect to the memory of departed friends by adorning their graves and offering libations for their repose.

For him, as dead, with pious care,

This goblet I prepare:

And on the bosom of the earth shall flow,

Streams from the heifer mountain-bred,

The grape's rich juice, and mixed with these

The labour of the yellow bees,

Libations soothing to the dead.

Potter. (*Iphigen. Tauric. ver. 112.*)

It was customary not only to offer these libations of blood, wine, milk, honey, &c., but the grave stones were anointed with sweet unguents, and adorned with flowers.

Why do we precious ointments shower,

Noble wines why do we pour,

Beauteous flowers why do we spread,

Upon the monuments of the dead?

Cowley (*Anacreon. ode iv.*)

Various kinds of flowers were used for bedecking the tombs, as the jessamine, lily, rose, myrtle, &c.

————— The sepulchre,

Wherein he lies inurn'd, with wreaths of flowers,

Glowing in all their various dyes, hung round.

Potter. (*Sophocl. Electr. v. 895.*)

And it is still the custom in many parts of the Continent, and especially France, to deck the monuments and graves with bouquets

and chaplets, which are made of the flowers of *Gnaphalium*; the white chaplets adorn the graves of the young and unmarried, and the yellow often intermixed with other coloured flowers are placed upon the graves of the old and married. In our own country it is usual to place on the body as it lies in the coffin flowers fresh gathered from the garden.

4. *G. sylvaticum*, Linn. (Fig. 1260.) *Highland Cudweed*. Stem simple, erect, downy, terminating in an interrupted leafy spike; leaves linear, lanceolate, downy, the radical ones gradually tapering downwards, involucre oblong.

English Botany, t. 913.—English Flora, vol. iii. p. 415.—Hooker, British Flora, ed. 4. vol. i. p. 301.—Lindley, Synopsis, p. 145.

β. rectum. Leaves nearly smooth above; spike longer, more interrupted.

Hooker, British Flora, ed. 4. vol. i. p. 301.—*G. rectum*, Huds.—English Botany, t. 124.—English Flora, vol. iii. p. 416.—Lindley, Synopsis, p. 145.

Root of long fibres. *Stem* single, or several from the same root, erect, simple, very leafy, from four to twelve inches high, round, cottony. *Leaves* long, linear lanceolate, the radical ones gradually tapering downwards into a footstalk, the upper sessile, clothed with white cottony down, especially beneath in *β.*, nearly smooth above. *Inflorescence* a terminal interrupted leafy spike, of many flowers. *Involucre* oblong, smooth, of unequal scales, ovate oblong, green at the base, brown above, with a pale thin membranous margin. *Florets* yellowish, numerous, those of the margin tubular, with a ligulate limb, those of the disk with the limb five-cleft. *Fruit* ovate. *Pappus* of rough shining hairs.

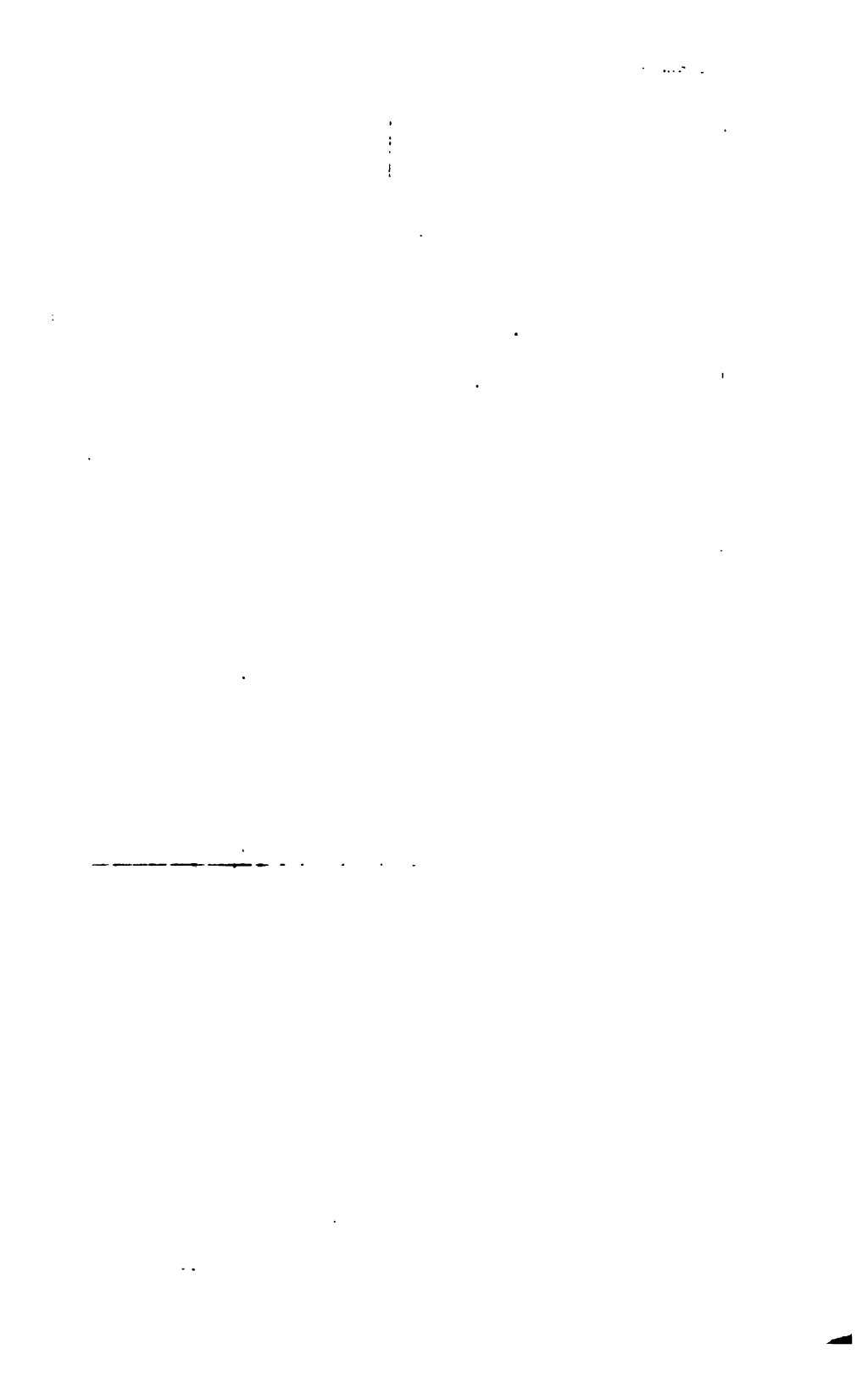
Habitat.—Groves, thickets, and pastures; frequent in Scotland.

Perennial; flowering in August.

5. *G. supinum*, Linn. (Fig. 1261.) *Dwarf Cudweed*. Stem decumbent, branched at the base; flowering stems erect; leaves narrow lanceolate, or linear, tomentose; flowers spicate, or solitary at the end of the stem.

English Botany, t. 1193.—English Flora, vol. iii. p. 416.—Hooker, British Flora, ed. 4. vol. i. p. 302.—Lindley, Synopsis, p. 145.—*Ornatheca*, De Cand.

Root fibrous. *Stems* several, somewhat creeping, flowering stem erect, from two to four inches high, erect, simple, terminating in a solitary flower, or a lax spike or raceme. *Leaves* linear, or lanceolate, clothed with a cottony pubescence on both sides, very numerous, and crowded at the base of the stem above, scattered. *Involucre* ovate, its scales smooth, lanceolate, dark brown towards the margin, green at the base, spreading when in flower. *Florets* tubular, the limb five-cleft, or irregular, yellow. *Fruit* ovate. *Pappus* of rough simple hairs.





1962

Graphalium uliginosum.



1963

Artemisia campestris.



1964

Artemisia maritima.



1965

Artemisia absinthium.



1966

Artemisia vulgaris



1967

Artemisia caerulea.

Habitat.—Summits of the Highland Mountains; abundant.
Perennial; flowering in July and August.

6. *G. uliginosum*, Linn. (Fig. 1262.) *Marsh Cudweed*. Stem erect, much branched and spreading, woolly; leaves linear lanceolate, the lower ones tapering towards the base; flowers in terminal crowded clusters, shorter than the accompanying leaves.

English Botany, t. 1194.—English Flora, vol. iii. p. 417.—Hooker, British Flora, ed. 4. vol. i. p. 302.—Lindley, Synopsis, p. 145.

Root small, fibrous. *Stem* two to four inches high, mostly numerous branched and spreading, leafy, thickly clothed with cottony pubescence. *Leaves* linear lanceolate, white and cottony on both sides, the lower ones gradually tapering to the base, spreading. *Flowers* in densely crowded axillary tufts, shorter than the accompanying leaves. *Involucre* ovate, smooth, of numerous narrow smooth shining membranous lanceolate scales, brown. *Florets* numerous, pale yellow, tubular, the limb five-cleft. *Fruit* very small, ovate. *Pappus* white, rough short hairs. *Receptacle* dotted, exposed after the fruit has fallen.

Habitat.—Wet and sandy places, especially where water has stood.
Annual; flowering from August to September.

GENUS XXVIII. ARTEMISIA.—LINN. *Wormwood, Southernwood.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, ovate, or globose. *Florets* few, all perfect, tubular, or those of the disk perfect, and of the circumference with pistils only. *Receptacle* naked, or hairy. *Pappus* wanting.—Name from *Artemis*, the Greek name of Diana.

1. *A. campestris*, Linn. (Fig. 1263.) *Field Southernwood*. Flowering stems ascending, paniculated; leaves smooth, or silky, bi- or tri-pinnatifid, with linear mucronate segments, the floral leaves undivided; involucre ovate, smooth, of ovate membranous margined scales.

English Botany, t. 338.—English Flora, vol. iii. p. 407.—Hooker, British Flora, ed. 4. vol. i. p. 300.—Lindley, Synopsis, p. 149.

Root tapering, the whole plant with a peculiar odour and bitter flavour. *Stems* numerous, the barren ones cespitose, the fertile ones ascending when in flower, round, smooth, slender, leafy, branched, from one to two feet high. *Leaves* very numerous, the radical ones bi- or tri-pinnate, on long slender spreading footstalks, the upper ones sessile, pinnatifid, and the floral ones simple, linear, the segments all linear, bristle pointed, smooth on the upper side, silky on the under,

sometimes on both. *Heads* ovate, numerous on the top of the stem and branches, solitary, rarely two from the axis of the floral leaves, drooping, the *scales* ovate, smooth, green at the base, the margin pale, membranous. *Florets* yellow, numerous, tubular. *Receptacle* small, naked.

Habitat.—Dry sandy heaths; rare. Norfolk and Suffolk, especially about Thetford and Bury.

Perennial; flowering in August.

2. *A. maritima*, Linn. (Fig. 1264) *Sea Wormwood*. Flowering stems erect; leaves white, with close down, bi- or tri-pinnatifid, with linear obtuse segments, the floral leaves undivided; involucre oblong, downy, of oblong linear membranous margined scales.

English Botany, t. 1001.—English Flora, vol. iii. p. 408.—Hooker, British Flora, ed. 4. vol. i. p. 300.—Lindley, Synopsis, p. 149.

β. gallica, Willd. Racemes and flowers erect, not drooping.

A. gallica, Willd.—English Flora, vol. iii. p. 409.—Lindley, Synopsis, p. 149.—*A. maritima*.—English Botany, t. 1706.—*β.* Hooker, British Flora, ed. 4. vol. i. p. 300.

Root woody, with many slender branched fibres, the whole plant hoary, with a fine coat of cottony down. *Stems* several, the barren ones cespitose, and recumbent, the flowering ones erect, woody, furrowed, much branched, and very leafy, about two feet high. *Leaves* bi- or tri-pinnatifid, the segments narrow, linear, obtuse, the lower ones with a long slender petiole, the upper ones sessile, the floral ones simple, linear, undivided. *Heads* cylindrical, oblong, in drooping or erect racemose clusters on the upper part of the stem and branches, the scales linear, oblong, downy, with a brown membranous margin. *Florets* tubular, five-cleft, of a tawny colour. *Receptacle* small, naked.

Habitat.—On the sea shore about the mouths of rivers and salt marshes.

Perennial; flowering in August.

This is readily distinguished by its oblong downy heads and hoary leaves. It has a more agreeable aromatic odour, and less bitter to the taste than the common Wormwood. It is very common on the coast of the Mediterranean.

3. *A. Absinthium*, Linn. (Fig. 1265.) *Common Wormwood*. Stem erect, paniculated; leaves bi- or tri-pinnatifid, clothed with silky down, the segments lanceolate, obtuse, the floral leaves undivided; heads sub-globose, silky, drooping; involucre scales linear, obtuse, the margin membranous; receptacle hairy.

English Botany, t. 1230.—English Flora, vol. iii. p. 409.—Hooker, British Flora, ed. 4. vol. i. p. 300.—Lindley, Synopsis, p. 149.

Root woody, branched, and fibrous, the whole plant clothed with close silky down. *Stems* several, bushy, about a foot high, leafy,

erect, furrowed. *Leaves* bi- or tri-pinnatifid, the segments broad, linear lanceolate, greener on the upper than the under side, the lower ones with long channeled footstalks, dilated at the base, the upper ones sessile, or nearly so, the floral ones undivided, sessile. *Heads* sub-globose, drooping. *Involucre* silky, its scales linear, obtuse, with a jagged membranous margin. *Florets* numerous, pale yellow or buff, short, tubular, the outer ones ligulate, those of the disk five-cleft. *Styles* deeply cloven. *Receptacle* convex, clothed with fine erect hairs.

Habitat.—Waste places, especially about villages.

Perennial; flowering in August.

This species has long been known as a tonic, anti-spasmodic, and anthelminthic, and has been used with advantage in intermittent fevers, gout, scurvy, &c.; it is not now much regarded, though as a stomachic medicine few plants are better. The whole plant has a strong pungent smell, a rather disagreeable intense bitter taste. Its smell is owing to a volatile oil with which it abounds. When burned, its ashes afford a large proportion of alkaline salt, and the shops were supplied from this source, and though now procured from many other plants, it is still often sold under the name of Salt of Wormwood. The seeds are used by rectifiers of British Spirits to give them a flavour. The odour of the plant is supposed to be very objectionable to various kinds of insects, and for the purpose of preventing their intrusion, it is placed in drawers amongst clothes, in chests, &c.

4. *A. vulga'ris*, Linn. (Fig. 1266.) *Mugwort*. Stem erect, paniculated; leaves pinnatifid, white and downy beneath, the segments lanceolate, acuminate, entire, or toothed, the floral leaves lanceolate, acuminate, entire; heads ovate, or oblong, downy; involucre scales lanceolate; receptacle naked.

English Botany, t. 978.—English Flora, vol. iii. p. 410.—Hooker, British Flora, ed. 4 vol. i. p. 301.—Lindley, Synopsis, p. 149.

Root woody, with numerous branched fibres. *Stems* several, erect, branched and paniculated above, furrowed, often reddish, smooth or downy, three or four feet high. *Leaves* numerous, alternate, deeply cut in a pinnatifid manner, the segments lanceolate, entire or toothed, dark green, and smooth above, white, with close woolly down beneath, the lower ones petiolated, the upper sessile, the floral leaves lanceolate, entire. *Heads* ovate oblong, woolly, very numerous, in crowded racemose clusters on the top of the stem and branches. *Involucre* of pale membranous lanceolate scales. *Florets* few, brownish, tubular, slender, the marginal ones ligulate, those of the disk five-cleft. *Receptacle* naked.

Habitat.—Hedges and waste places; common.

Perennial; flowering in August.

The sensible qualities of this plant are very faint, nevertheless it was formerly held in high esteem as an emmenagogue, and its infusion was used as a bath, to invigorate the body after fatigue, but it is not now used for these purposes.

5. *A. cœrulescens*, Linn. (Fig. 1267.) *Bluish or Lavender-leaved Mugwort*. "Leaves hoary, most of them lanceolate, undivided, tapering at the base, lower ones variously divided; flowers erect, cylindrical; receptacle naked."—Smith.

English Botany, t. 2426.—English Flora, vol. iii. p. 411.—Hooker, British Flora, ed. 4. vol. i. p. 301.—Lindley, Synopsis, p. 149.

"Plant rather shrubby, with round slender smooth leafy branches, downy when young. *Leaves* of a bluish hoary hue, finely silky in an early state, especially beneath, all tapering at the base, and somewhat stalked, many of them ovate oblong, obtuse, entire; floral ones smaller, and more linear, several about the lower part of the stem, three-cleft, or pinnatifid. *Flowers* ovate oblong, small, mostly erect, in copious aggregate leafy clusters or spikes. *Receptacle* naked, small. From garden and exotic specimens."

Habitat.—On the sea coast; a very doubtful native. Near Boston, Lincolnshire, and the Isle of Wight, but not now found there.

Perennial; flowering in August and September.

GENUS XXIX. TANACETUM.—Linn. *Tansy*.

Nat. Ord. COMPOSITE. Juss.

GEN. CHAR. *Involuorum* hemispherical, imbricated. *Florets* all tubular, those of the disk five lobed, perfect, of the ray three lobed, and with pistils only. *Receptacle* naked. *Fruit* crowned with a membranous margin in the place of *pappus*.—Name altered from *Athanasia*; α , not; and *thanasos*, death; or that which does not quickly fade.

1. *T. vulgare*, Linn. (Fig. 1268.) *Common Tansy*. Leaves bipinnatifid, the lacene cut and serrated.

English Botany, t. 1229.—English Flora, vol. iii. p. 405.—Hooker, British Flora, ed. 4. vol. i. p. 300.—Lindley, Synopsis, p. 149.

Root fibrous, with creeping underground stems. *Stem* erect, about two feet high, smooth, somewhat angular and furrowed, simple. *Leaves* numerous, about three inches long, spreading, smooth, dark green, bi-pinnatifid, the lacene lanceolate, oblong, cut and serrated. *Inflorescence* a terminal corymb, of numerous heads of golden yellow flowers. *Involucre* hemispherical, smooth, oblong, with a membranous jagged margin. *Florets* numerous, crowded, short, tubular. *Fruit* oblong, angular, crowned with a slight membranous border in the place of *pappus*.





1268

Tanacetum vulgare.



1269

Bidens cernua.



1270

Bidens tripartita.



1271

Diotis maritima.



1272

Inula helenium.



1273

Inula congra

Habitat.—Borders of fields, road sides, &c.

Perennial; flowering in July and August.

The whole plant has a strong smell and bitter stimulating taste, which qualities have caused it to be used as a tonic to strengthen the digestive organs, and at the same time it is said to expel worms from the intestinal canal. The juice of the young leaves is used for flavouring some kinds of pudding, but it is not now esteemed so much as formerly. A curled leaved variety is often found, and this is the kind mostly cultivated in gardens.

GENUS XXX. BIDENS.—LINN. *Bur-marigold*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucre* of many scales, the outer ones mostly leafy, and spreading. *Florets* all tubular, and perfect, or if ligulate on the circumference imperfect. *Receptacle* plane, paleaceous. *Pappus* of from two to five persistent awns.—Name from *bis*, two; and *dens*, a tooth; from the two awns or teeth upon the fruit.

1. *B. cer'nua*, Linn. (Fig. 1269.) *Nodding Bur-marigold*. Head drooping; leaves of involucre lanceolate, entire, longer than the flower; leaves lanceolate, serrated; fruit obovate, wedge-shaped, crowned with about three bristles.

English Botany, t. 1114.—English Flora, vol. iii. p. 400.—Hooker, British Flora, ed. 4. vol. i. p. 299.—Lindley, Synopsis, p. 151.

Root of numerous branched fibres. *Stem* erect, from one to two feet high, round, furrowed, branched, somewhat hispid. *Leaves* smooth, lanceolate, deeply serrated, dilated at the base, and often united in a connate manner. *Flowers* terminal, and on axillary peduncles, drooping, large, greenish yellow, the outer *florets* simple, or radiant, the inner short, tubular, the limb five-cleft. *Involucre* of lanceolate leafy scales, longer than the head, and shorter lanceolate ones. *Fruit* obovate, wedge-shaped, smooth, or roughish, crowned with three or four erect rough bristles. *Receptacle* with thin lanceolate membranous paleaceous scales.

Habitat.—Sides of rivers, ditches, and lakes; frequent.

Annual; flowering in June and July.

2. *B. tripartita*, Linn. (Fig. 1270.) *Trifid Bur-marigold*. Heads erect; leaves of involucre lanceolate, entire, as long or longer than the flower; leaves tri-partite, the lacene lanceolate, serrated; fruit obovate, wedge-shaped, rough, crowned with two or three teeth.

English Botany, t. 1113.—English Flora, vol. iii. p. 399.—Hooker, British Flora, ed. 4. vol. i. p. 299.—Lindley, Synopsis, p. 151.

Root of numerous branched fibres. *Stem* erect, about three feet high, angular, smooth, leafy, mostly much branched, and purplish. *Leaves* smooth, dark green, cut into three or five lanceolate serrated segments, the footstalk broad, often winged, the upper leaves and often the lower ones entire. *Flowers* terminal, and on axillary peduncles, erect, or slightly drooping, not very large, yellowish green. *Involucre* of lanceolate membranous margined scales, accompanied with outer longer leafy ones. *Florets* tubular, the limb five-cleft. *Fruit* obovate, wedge-shaped, three angled, the angles rough, and terminating in an erect awn, rough, with reflexed bristles. *Receptacle* with lanceolate membranous paleaceous scales.

Habitat.—Sides of rivers, ditches, and watery places; frequent.

Annual; flowering in August and September.

This is readily distinguished from the other species, by its divided leaves and smaller flowers. The whole plant is said to give a good yellow colour to woollen or linen goods, and might be used as a dye.

GENUS XXXI. DIOTIS.—DESF. *Cotton-weed*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* hemispherical, imbricated. *Florets* all tubular, perfect, five toothed, contracted in the middle, auriculated or saccated on one side at the base. *Receptacle* convex, paleaceous, its scales fringed. *Fruit* crowned by the lower persistent half of the corolla in the place of *pappus*.—Name from *dis*, two; and *ous*, *ωτος*, an ear; from the ear-like appendages to the fruit.

1. *D. maritima*, Cass. (Fig. 1271.) *Sea-side Cotton-weed*.

English Flora, vol. iii. p. 404.—Hooker, British Flora, ed. 4. vol. i. p. 300.—Lindley, Synopsis, p. 150.—*D. candidissima*, Desf.—*Santolina*.—English Botany, t. 141.

Root of numerous long tufted branches, the whole plant is clothed with a thick white coat of woolliness. *Stem* about a foot high, recumbent at the base, round, very leafy, branched in a corymbose manner above. *Leaves* oblong, obtuse, flat, crenated on the margin, about half an inch long, flat, flattered, persistent. *Inflorescences* loosely corymbose. *Flowers* sub-globose. *Involucre* oblong, imbricated, very woolly. *Florets* yellow, tubular, the limb of five equal lobes, the tube contracted near the top, swollen on each side at the base into two compressed auriculated lobes, this part of the tube remains closely investing the fruit, while the upper part falls away. *Receptacle* with oblong paleaceous scales, fringed on the margin.

Habitat.—Sandy sea shores, chiefly on the South and East Coast of England.

Perennial ; flowering in August and September.

This is the only known species of the genus, and is remarkable from its thick woolly clothing and small flowers, almost concealed by its thick involucre scales, as well as in the structure of the flowers and fruit. It is not unfrequent on the coast of Spain, Portugal, and the shores of the Mediterranean.

ORDER II.

POLYGAMIA SUPERFLUA.

(*Florets of the centre with tubular corollas perfect, (having stamens and pistils) those of the circumference imperfect, (having pistils only), the corolla ligulate, and forming a ray*).

GENUS XXXII. INUL'A.—LINN. *Elecampane*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucre* imbricated. *Florets* of the ray ligulate, imperfect. *Anthers* bristle pointed at the base. *Receptacle* naked, *Pappus* hairy, in a single row.—Name of doubtful origin.

1. *I. Helen'ium*. Linn. (Fig. 1272.) *Elecampane*. Leaves unequally dentato-serrated, downy beneath, the radical ones elliptic oblong, petiolated, the upper ovate, heart-shaped, acuminate, amplexicaul; involucre with the outer scales leafy, downy, ovate, the inner linear, spatulate.

English Botany, t. 1546.—English Flora, vol. iii. p. 441.—Hooker, British Flora, ed. 4. vol. i. p. 306.—Lindley, Synopsis, p. 143.

Root fleshy, thick, branched, bitter, and mucilaginous, with an aromatic odour. *Stem* erect, three to four feet high, round, furrowed, branched, and downy, especially the upper part. *Leaves* numerous, darkish green, and smooth above, white, with thick close pubescence beneath, the margin unequally toothed or serrated, the lower leaves large, about a foot long, elliptic oblong, or lanceolate, with a long footstalk, those of the stem ovate, heart-shaped, acute, embracing the stem at the base, large, the uppermost ones small, often lanceolate. *Flowers* large, terminal, solitary, about two inches across, bright yellow. *Involucre* of numerous scales, the outer ones leafy, ovate, downy, the inner ones lanceolate, spatulate, nearly smooth. *Florets* very numerous, those of the ray ligulate, with a long narrow limb, unequally three toothed at the end, the central ones tubular, five-cleft. *Fruit* quadrangular, smooth. *Pappus* of rigid rough bristly hairs. *Receptacle* reticulated.

Habitat.—Moist meadows and pastures; rare. In various parts of England, Scotland, and Ireland.

Perennial; flowering in July and August.

The aroma of the roots is greatly increased by drying, in which state it much resembles that of Orris root. It was formerly much used as a medicine in dyspeptic and pulmonic affections, but is now entirely abandoned.

2. *I. Conyza*, *De Cand.* (Fig. 1273.) *Ploughman's Spikenard*. Stem herbaceous, branched in a corymbose manner above; leaves ovate lanceolate, toothed, downy, especially beneath, the upper ones sessile, the lower with petioles; involucre scales recurved at the point, the outer ones leafy.

Hooker, *British Flora*, ed. 4. vol. i. p. 306.—*Conyza squarrosa*, Linn.—*English Botany*, t. 1195.—*English Flora*, p. 421.—Lindley, *Synopsis*, p. 142.

Root tapering, fleshy, with many branched fibres. *Stem* erect, round, or angular, striated, purple, leafy, about three feet high, simple below, branched above in a corymbose manner, clothed with close woolly down. *Leaves* lanceolate, or elliptic lanceolate, veiny, somewhat rugose, the margin unequally serrated, dark green and downy above, pale and woolly beneath, the upper leaves nearly sessile, the lower on broadish footstalks. *Flowers* numerous, oblong, obtuse, yellowish pink. *Inflorescence* a large terminal sub-corymbose panicle, the floral leaves linear, entire. *Involucre* conical, imbricated, the scales lanceolate, the outer ones leafy, the inner sub-membranous, all recurved at the points. *Florets* numerous, the outer ones small, ligulate, those of the disk tubular, with a five-cleft limb. *Fruit* obovate, small. *Pappus* erect, rough, white bristles.

Habitat.—Woods in shady places, especially in a limestone or clayey soil. "Rare, if really wild, in Scotland."

Biennial; flowering in July and August.

The leaves, when rubbed between the fingers, give out an aromatic smell. It is not, however, applied to any particular use.

3. *I. crithmoides*, Linn. (Fig. 1274.) *Golden Samphire*. Leaves linear, fleshy, those of the stem mostly three toothed at the extremity of the branches, entire.

English Botany, t. 68.—*English Flora*, vol. iii. p. 443.—Hooker, *British Flora*, ed. 4. vol. i. p. 306.—*Limbarda tricuspis*, Cassini.—Lindley, *Synopsis*, p. 143.

Root somewhat creeping, the whole plant smooth. *Stem* erect, round, somewhat woody, about a foot high. *Leaves* very numerous, alternate, often in crowded tufts, linear, fleshy, those of the stem often three-cleft towards the end. *Flowers* bright yellow, about an inch across, mostly several, terminating the stem, each on a branch, crowded with leafy bractes. *Involucre* smooth, of numerous linear



1274

Inula orithmoides.



1275

Pulicaria dysenterica.



1276

Pulicaria vulgaris.



1277

Aster tripolium.



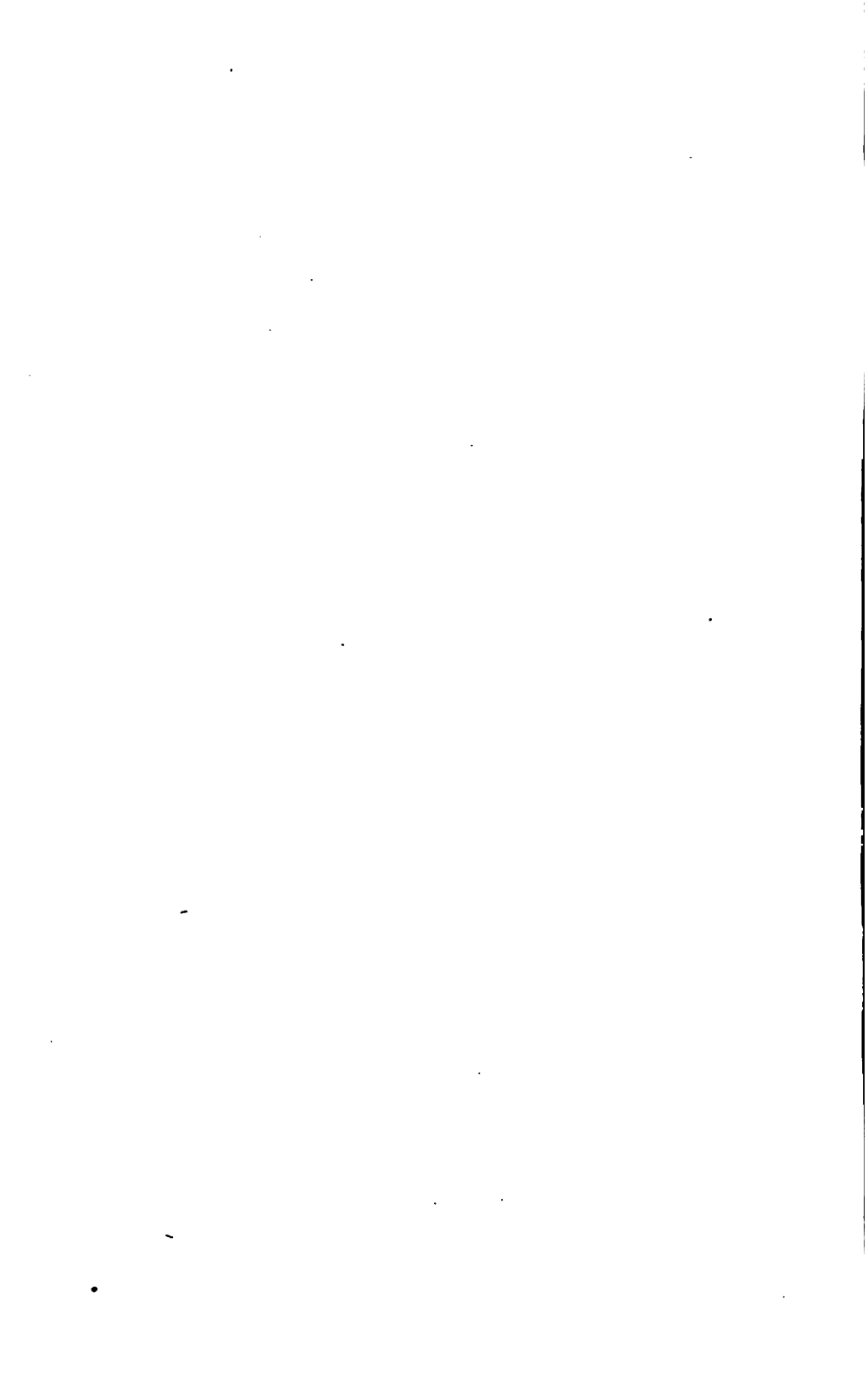
1278

Erigeron canadensis.



1279

Erigeron acris.



awl-shaped scales, imbricated. *Florets* numerous, the outer ones ligulate, three toothed at the end, forming a ray, those of the disk tubular, five-cleft. *Fruit* ovate. *Pappus* of rough white erect bristly hairs.

Habitat.—Salt marshes and rocks near the sea, in the South and West side of England and Wales; as far North as Galloway Howth, Ireland.

Perennial; flowering in August.

GENUS XXXIII. PULICARIA.—GÆRTN. *Flea-bane*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated. *Florets* of the ray ligulate, imperfect. *Anthers* bristle pointed at the base. *Receptacle* naked. *Pappus* double, the outer short, membranous, cup-shaped, toothed or crenated on the margin, the inner of elongated hairs.—Name *pulex*, a *flea*; so called from the supposition that fleas are driven away by the smell of some of the species.

1. *P. dysenterica*, Cass. (Fig. 1275.) *Common Flea-bane*. Leaves oblong, wrinkled, downy, especially beneath, cordate or sagitate at the base, and embracing the woolly stem, branched above; involucre scales setaceous.

Hooker, British Flora, ed. 4. vol. i. p. 306.—Lindley, Synopsis, p. 143.—*Inula*, Linn.—English Botany, t. 1115.—English Flora, vol. iii. p. 441.

Root somewhat creeping. *Stem* erect, from one to two feet high, round, striated, woolly, leafy, branched above. *Leaves* oblong lanceolate, dark green, and slightly downy above, pale and woolly beneath, veiny, wrinkled, waved or toothed on the margin, from one to two inches long, sessile, and heart-shaped or arrow-shaped at the base, the lobes embracing the stem. *Inflorescence* sub-corymbose. *Flowers* numerous, bright yellow. *Involucre* woolly, its scales very numerous, bristle-shaped. *Florets* of the circumference long, ligulate, three toothed at the end, those of the circumference tubular, five-cleft. *Fruit* obovate, bristly. *Pappus* the outer rim narrow, crenated, the inner of bristly hairs. *Receptacle* somewhat cellular, and toothed.

Habitat.—Moist shady places; frequent in England, rare in Scotland; Mull of Galloway, and Bannanhead, Arran; the County of Dublin, Ireland.

Perennial; flowering in August.

The whole plant is somewhat glutinous, and has a slight acrid aromatic smell, resembling the flavour of peaches. It once had the reputation as a valuable medicinal plant in the cure of dysentery, from which reason it obtained its specific name; but its virtues are

so slight, that it has fallen into disuse. The flowers are sometimes found with the ray very short.

2. *P. vulgaris*, Gærtn. (Fig. 1276.) *Small Flea-bane*. Leaves oblong, lanceolate, waved, rounded at the base, sessile, and sub-amplexicaul; stem much branched, paniculated, hairy; flowers lateral and terminal; ray very short.

Hooker, British Flora, ed. 4. vol. i. p. 306.—Lindley, Synopsis, p. 143.—*Inula pulicaria*, Linn.—English Botany, t. 1196.—English Flora, vol. iii. p. 442.

Root branched, fibrous. *Stem* erect, about eight inches high, round, finely hairy, often purplish, much branched and spreading. *Leaves* few, scattered, elliptic oblong, acute, entire or waved upon the margin, hairy, sessile, narrowed at the base, embracing the stem. *Flowers* terminal and axillary, solitary, small, pale yellow. *Florets* tubular, five-cleft, the marginal ones ligulate, three toothed, forming a very short ray. *Involucre* downy, of linear acute scales, nearly all of the same length. *Fruit* quadrangular, downy. *Pappus* double, the outer rim membranous, toothed, the inner of erect rough rather short bristly hairs. *Receptacle* tuberculated, and somewhat hairy, or smooth.

Habitat.—Moist sandy places, especially where water has stood; not common in England: not found in Scotland or Ireland.

Annual; flowering in September.

GENUS XXXIV. ASTER.—LINN. *Star-wort*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, the scales linear, acute. *Florets* of the ray ligulate, imperfect, usually purple, those of the disk tubular, perfect, yellow. *Receptacle* naked. *Fruit* compressed. *Pappus* hairy, in many rows.—Name *aster*, a *star*; from the resemblance of the flower to a star.

1. *A. Tripo'lium*, Linn. (Fig. 1277.) *Sea Star-wort*, or *Michaelmas Daisy*. Leaves linear lanceolate, fleshy; stem smooth, branched, sub-corymbose; involucre imbricated, the scales lanceolate, obtuse, membranous.

English Botany, t. 87.—English Flora, vol. iii. p. 427.—Hooker, British Flora, ed. 4. vol. i. p. 304.—Lindley, Synopsis, p. 143.

Root fibrous, the whole plant smooth, a somewhat glaucous green. *Stem* erect, round, branched, from a few inches to two or three feet high, leafy. *Leaves* fleshy, linear lanceolate, with an obtuse point, the upper ones sessile, the lower and radical ones tapering into a footstalk, larger. *Flowers* numerous, terminating the stem and branches in sub-corymbose clusters. *Involucre* imbricated, smooth,

of lanceolate obtuse scales, membranous on the margin. *Florets* numerous, those of the ray with a long ligulate lip, two or three toothed at the end, blue, spreading, those of the disk short, tubular, yellow, the limb five-cleft. *Fruit* oblong, compressed, downy. *Pappus* of rough spreading bristle hairs.

Habitat.—Salt marshes; frequent.

Perennial; flowering in August and September.

The species of this genus are very numerous (De Candolle enumerates one hundred and fifty). They are commonly known by the names of Michaelmas Daisy, Christmas Daisy, China Aster, &c. Some of them are very ornamental, and flower at that season of the year, when there are but few others to rival them. As an autumnal border flower, few surpass in beauty or variety of colour the flowers of the China Aster, which are single, semi-double, and double. They are easy of cultivation: the best method is by first raising them in a hot-bed of moderate heat, and transplanting them into the open borders in the latter end of April or May: they require a good loose soil and an open sunny exposure.

GENUS XXXV. ERIGERON.—LINN. *Flea-bane*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, with linear scales, very numerous. *Florets* of the ray imperfect, with very narrow linear ligulate corollas. *Receptacle* naked. *Pappus* hairy, rough.—Name $\epsilon\gamma\varsigma$, *early*; and $\gamma\epsilon\tau\omega\nu$, *an old man*; so called from the bald looking heads of the receptacles after the fruit has fallen.

1. *E. Canadensis*, Linn. (Fig. 1278.) *Canada Flea-bane*. Stem erect, paniculated; panicle oblong, many flowered; leaves hairy, linear lanceolate, the lower ones remotely serrated.

English Botany, t. 2019.—English Flora, vol. iii. p. 422.—Hooker, British Flora, ed. 4. vol. i. p. 303.—Lindley, Synopsis, p. 144.

Root tapering. *Stem* erect, wand-like, round, or somewhat angular, leafy, hairy, from one to three feet high. *Leaves* numerous, scattered, hairy, ciliated, linear lanceolate, tapering at each end, the lower ones remotely toothed, the rest entire. *Inflorescences* an oblong panicle, its branches short, many flowered. *Flowers* small, yellow. *Involucre* imbricated, smooth, linear lanceolate, membranous. *Florets* small, those of the ray with a short ligulate toothed lip, those of the disk tubular, five-cleft. *Fruit* small, white, silky, angular. *Pappus* rough, spreading, white hairs.

Habitat.—Waste and cultivated ground in England.

Annual; flowering in August and September.

A very doubtful native, probably escaped from gardens, or brought from the Continent, where it is a very common plant on sandy banks, old walls, and in dry waste places.

2. *E. a'cris*, Linn. (Fig. 1279.) *Blue Flea-bane*. Stem erect, branched, the branches one to three flowered; leaves distant, linear lanceolate, hairy, the lower ones petiolated; florets of the ray erect.

English Botany, t. 1158.—English Flora, vol. iii. p. 423.—Hooker, British Flora, ed. 4. vol. i. p. 303.—Lindley, Synopsis, p. 144.

Root fibrous, the whole plant rough, with short pubescence. *Stem* erect, from one to one and half feet high, simple below, branched in a paniculated manner above, striated, often purplish. *Leaves* of the stem linear lanceolate, obtuse, sessile, scattered, distant, the lower and radical ones obovate, obtuse, petiolated, the petiole woolly. *Flowers* one, two, or three upon the branches. *Involucre* of linear lanceolate or awl-shaped scales, downy, erect. *Florets* tubular, those of the ray with a rather short erect lip, purple, those of the disk yellow, five-cleft, much concealed by the long brownish *pappus*, roughish. *Fruit* oblong, compressed, downy.

Habitat.—Dry gravelly or chalky pastures, on old walls, &c.

Biennial; flowering in July and August.

3. *E. alpi'nus*, Linn. (Fig. 1280.) *Alpine Flea-bane*. Stem erect, mostly single flowered; leaves lanceolate, hairy, lower ones petiolated, sub-spathulated; *pappus* shorter than the florets of the ray; involucre hairy.

English Botany, t. 464.—English Flora, vol. iii. p. 424.—Hooker, British Flora, ed. 4. vol. i. p. 303.—Lindley, Synopsis, p. 144.

Root somewhat woody, branched, and fibrous. *Stem* erect, from four to six inches high, round, leafy, striated, hairy, mostly terminating in a single flower, sometimes there are two or three. *Leaves* hairy, those of the stem lanceolate, scattered, distant, the radical ones oblong, spatulate, petiolated, numerous, spreading. *Involucre* of lanceolate erect scales, more or less hairy or woolly. *Florets* numerous, those of the ray with a longish narrow ligulate limb, of a light purple colour, spreading, those of the disk yellow, tubular, with a short five cleft limb. *Fruit* small, pale, ovate, compressed, silky. *Pappus* of erect rough silky hairs, shorter than the florets.

Habitat.—Moist rocky places on mountains; Highland Mountains of Scotland, not common, except on the Breadalbane range.

Perennial; flowering in July.

The *E. uniflora*, Linn., English Botany, t. 2416, English Flora, vol. iii. p. 424, is the *E. alpinus*, β ., Hooker, British Flora, ed. 4. vol. i. p. 303, and Lindley, Synopsis, p. 144.

The difficulty of limiting the species of these alpine plants, when their characters are those of size, hairiness, and a slight difference in



1280

Erigeron alpinum.



1281

Solidago Virgaurea.



1282

Cineraria campestris.



1283

Cineraria palustris.



1284

Senecio vulgaris.

the form of some of the leaves, is very great, if not impossible, as their variations depend upon the more or less exposed or elevated situation in which they have grown, and also upon the supply of moisture.

GENUS XXXVI. SOLIDAGO.—LINN.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated. *Florets* of the ray ligulate, imperfect, yellow, few in number. *Receptacle* naked. *Fruit* roundish. *Pappus* hairy, in a single row — Name from *Solidare*, to unite; so called on account of its vulnerary properties.

1. *S. Virgaurea*, Linn. (Fig. 1281.) *Common Golden-rod*. Stem erect, terminated in an erect paniculated raceme; leaves ovate lanceolate, petiolated, the lower ones elliptic, serrated.

English Botany, t. 301.—English Flora, vol. iii. p. 439.—Hooker, British Flora, ed. 4. vol. i. p. 306.—Lindley, Synopsis, p. 144.

β. *Cambrica*. Stem small, flowers large, and the radical leaves broader.

S. Cambrica, Hudson.—Lindley, Synopsis, p. 144.

γ. *angustifolia*. Leaves all lanceolate, obscurely serrated, or entire.

Root long simple fibres. *Stem* from a few inches to three feet high, erect, mostly simple, angular, purplish, nearly smooth below, downy above, leafy. *Leaves* nearly smooth above, downy beneath, the upper ones lanceolate, serrated, or entire, the lower oblong, or elliptic lanceolate, serrated, all with somewhat winged footstalks. *Inflorescence* a terminal elongated crowded many flowered erect paniculated raceme. *Bractees* small, awl-shaped. *Involucre* of membranous lanceolate oblong imbricated scales. *Florets* yellow, tubular, those of the ray about seven, ligulate, spreading, those of the disk with a short five-cleft limb. *Fruit* oblong, downy. *Pappus* rough white hairs, spreading.

Habitat.—Groves, thickets, road sides in various situations.

Perennial; flowering in July and September.

This is an extremely variable plant, from the circumstance of its growing in such different soils and situations, for it is found as common upon low lands as on the sides of elevated mountains. It is sometimes cultivated in groves and shaded situations, but as a border flower it is scarcely admissible.

GENUS XXXVII. CINERARIA.—LINN. *Flea-wort.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* cylindrical, of numerous erect equal scales. *Florets* yellow, those of the ray ligulate. *Receptacle* naked. *Fruit* sulcated. *Pappus* hairy.—Name *cineres*, *ashes*; so called from the ashen colour of the under side of the leaves of some of the species.

1. *C. palustris*, Linn. (Fig. 1282.) *Marsh Flea-wort.* Villous, stem hollow, much branched, the branches corymbose at the end; leaves broadly lanceolate, sessile, amplexicaul, the lower ones sinuato-dentate.

English Botany, t. 151.—English Flora, vol. iii. p. 444.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 147.

Root long deep fibres, the whole plant of a light greyish green colour, clothed with soft jointed hairs, clammy to the touch. *Stem* erect, about three feet high, much branched, hollow, angular, leafy, and as well as the branches terminating in a corymbose cluster of bright yellow *flowers*, each on a very shaggy peduncle. *Involucre* of pale green lanceolate shaggy scales, erect, all of equal length. *Florets* numerous, those of the ray with a short ovate spreading limb, of the disk tubular, five toothed. *Fruit* small, ovate, furrowed. *Pappus* long, snow white, abundant.

Habitat.—Margins of pools, ditches, and marshy places, especially in Norfolk and Cambridgeshire.

Perennial; flowering in June and July.

2. *C. campestris*, Retz. (Fig. 1283.) *Field Flea-wort.* Woolly, stem simple, terminating in a simple umbel; radical leaves ovate, or sub-rotundate, contracted into a short petiole, nearly entire, the upper lanceolate, sessile; involucre smooth above, woolly at the base; fruit hispid.

Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 147.—*C. integrifolia*, Withering.—English Botany, t. 152.—English Flora, vol. iii. p. 445.

Root of long fibres, the whole plant more or less thickly clothed with loose cobweb-like pubescence, most abundant on the under side of the leaves. *Stem* erect, simple, about eight inches high, round, striated, woolly, terminating in a simple umbel, of a few yellow flowers, each on a shaggy peduncle, and accompanied at the base with a lanceolate *bractea*. *Leaves* numerous at the base of the stem, ovate or sub-rotundate, entire or crenated, mostly contracted at the base into a short broad footstalk, those of the stem not very numerous, lanceolate, sessile, all with a loose thin layer of cottony cobweb-like pubescence above, but beneath it is much thicker. *Involucre* scales lanceolate, nearly smooth above, woolly at the base. *Florets*

yellow, those of the ray with an ovate three toothed limb, of the disk tubular, toothed on the margin. *Fruit* oblong, angular, hispid. *Pappus* of long rough white spreading hairs.

Habitat.—Chalky and sandy soil in the Middle and South of England.

Perennial; flowering in May and June.

GENUS XXXVIII. SENE'CIO.—Linn. *Groundsel*.

Nat. Ord. COMPOSITÆ. Juss.

GEN. CHAR. *Involucrum* cylindrical, or conical, of numerous linear equal scales, and several smaller ones scattered at the base, the tips mostly brown or black. *Florets* of the ray ligulate, sometimes wanting. *Receptacle* naked. *Fruit* sulcated. *Pappus* hairy.—Name from *senex*, an old man; so called from the bald receptacles resembling a bald head.

* *Flowers without rays.*

1. *S. vulgaris*, Linn. (Fig. 1284.) *Common Groundsel*. Leaves pinnatifid, toothed, the lower petiolated, the upper sessile, auriculated, semi-amplexicaul; involucre scales black, tipped, those at the base very short; florets of the ray simple, not ligulate.

English Botany, t. 747.—English Flora, vol. iii. p. 429.—Hooker, British Flora, ed. 4. vol. i. p. 304.—Lindley, Synopsis, p. 146.

Root long simple fibres, the whole plant smooth, or loosely covered over with a white cobweb-like pubescence. *Stem* erect, about a foot high, round, striated, more or less branched, leafy, pale purplish. *Leaves* bright green, pinnatifid, the lobes oblong, obtuse, toothed, the lower ones oblong, obovate, tapering into a footstalk, the upper sessile, auriculated at the base, and half embracing the stem. *Inflorescence* a terminal corymb of few or many flowers, terminating the stem and branches. *Involucre* cylindrical, of linear black tipped scales, those at the base small, and almost all black. *Florets* yellow, tubular, small, the limb five toothed, all the same. *Fruit* oblong, furrowed, rough, with short hairs. *Pappus* white silky hairs, spreading.

Habitat.—Waste ground, fields, gardens, &c.; common.

Annual; flowering during the summer months.

This is a very troublesome weed in gardens and ill cultivated grounds. It is the favourite food of many small birds, when gathered fresh and put upon their cages. It has also been used as a poultice to indolent tumours, ulcers, &c.; but for this purpose it is not now in any repute.

** *Flowers rayed, the rays rolled close back.*

2. *S. viscosus*, Linn. (Fig. 1285.) *Stinking Groundsel*. Leaves

pinnatifid, toothed, and viscid, as is the whole plant; involucre with the outer scales half as long as the inner, and lax; florets of the ray close, rolled back; stem branched, spreading.

English Botany, t. 32.—English Flora, vol. iii. p. 430.—Hooker, British Flora, ed. 4. vol. i. p. 304.—Lindley, Synopsis, p. 146.

Root fibrous, the whole plant clothed with viscid glutinous pubescence. *Stem* erect, about a foot high, round, furrowed, much branched and spreading. *Leaves* numerous, pinnatifid, the lobes oblong, obtuse, sinuated, toothed, sessile, and often embracing the stem. *Inflorescence* a terminal spreading panicle, peduncles erect. *Bractea* linear lanceolate. *Involucre* of erect linear lanceolate viscid scales, the outer ones loose, half as long as the inner. *Florets* of the ray ligulate, the limb closely rolled back, those of the disk tubular, five toothed, all bright yellow. *Fruit* oblong, pale, smooth. *Pappus* white, silky, erect, rough.

Habitat.—Waste ground, especially in a chalky or sandy soil.

Annual; flowering in July and August.

This plant is remarkable, from its clothing of soft viscid pubescence, and the strong foetid smell which it gives out when rubbed.

3. *S. sylvaticus*, Linn. (Fig. 1286.) *Mountain Groundsel*. Leaves deeply pinnatifid, the lobes linear, obtuse, toothed, and clothed with a loose cottony pubescence; involucre scales linear, erect, the outer ones small, close pressed; florets of the ray wanting, or closely rolled back; stem erect, simple, terminating in a corymbose panicle.

English Botany, t. 748.—English Flora, vol. iii. p. 431.—Hooker, British Flora, ed. 4. vol. i. p. 304.—Lindley, Synopsis, p. 146.

β. *lividus*. Leaves eared at the base, and amplexicaul.

Hooker, British Flora, ed. 4. vol. i. p. 304.—*S. lividus*.—English Botany, t. 2515.—English Flora, p. 430.—Lindley, Synopsis, p. 146.

Root fibrous, the whole plant more or less clothed with short pubescence, somewhat glutinous, and a loose cottony cobweb-like pubescence. *Stem* erect, simple, round, striated, leafy, about two feet high, terminating in a corymbose panicle of numerous flowers. *Leaves* about two inches long, irregularly pinnated, with oblong toothed lobes, sessile, or dilated at the base and auriculated, embracing the stem. *Involucre* cylindrical, smooth or downy, the scales linear, awl-shaped, the outer ones very short and small. *Florets* mostly all tubular, five toothed, sometimes those of the ray ligulate, the lip oblong, close, rolled back. *Fruit* oblong, pale, downy. *Pappus* white, spreading, slender, roughish.

Habitat.—Dry hilly pastures and waste places, in a sandy soil.

Annual; flowering in July.

This, like the last species, has an unpleasant odour when rubbed or bruised. Neither of them has been applied to any particular use.



1285

Senecio viscosus.



1286

Senecio sylvaticus.



1287

Senecio squallidus.



1288

Senecio tenuifolius.



1289

Senecio Jacobina.



1290

Senecio aquaticus.

*** *Flowers with spreading rays, leaves pinnatifid.*

4. *S. aquatilis*, Linn. (Fig. 1287) *Inelegant Ragwort*. Leaves pinnate, with distant linear toothed lobes, the upper sessile, and auriculated, the lower petiolated; corymb spreading, of few flowers; ray entire, ovate, spreading; fruit downy.

English Botany, t. 600.—English Flora, vol. iii. p. 432.—Hooker, British Flora, ed. 4. vol. i. p. 304.—Lindley, Synopsis, p. 146.

Root fibrous, the whole plant smooth, or covered over with a thin loose cottony pubescence. *Stem* erect, about eighteen inches high, leafy, branched. *Leaves* pinnate, about two inches long, the lobes distant, linear, more or less deeply toothed or jagged, the lower ones petiolated, the upper sessile, and mostly auriculated at the base, and embracing the stem. *Inflorescence* a terminal loose spreading few flowered corymb, pedicles with a few awl-shaped bractes. *Involucre* cylindrical, or hemispherical, smooth, linear, with a pale narrow membranous margin, the outer ones very small. *Florets* numerous, bright yellow, the outer ones forming the ray, with an ovate entire spreading limb, the inner tubular, five toothed. *Fruit* ovate, pale, silky. *Pappus* white, silky, roughish, long.

Habitat.—Old walls about Oxford and Bideford, Devon.

Annual; flowering from June to October.

This is a rare plant with us, and hitherto has only been found in the above situations, where it is probable it has been introduced. It is not an uncommon plant on the Continent in vineyards, on dry banks, and old walls.

5. *S. tenuifolius*, Jacq. (Fig. 1288.) *Hoary Ragwort*. Leaves pinnatifid, of numerous linear lobes, the margins rolled back, white, downy beneath, the lower petiolated, the upper sessile; stem erect, loosely cottony, branched above, corymbose; ray oblong, entire, spreading; fruit rough.

English Botany, t. 574.—English Flora, vol. iii. p. 433.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 146.

Root with long stout fibres. *Stem* erect, from two to three feet high, angular, furrowed, clothed with a loose cottony pubescence, simple or branched towards the top. *Leaves* numerous, nearly smooth, or loosely cottony above, beneath clothed with white pubescence, deeply cut into narrow pinnatifid lobes, which are entire or toothed, the margin flat, or rolled back, very various in width, often linear, sometimes ovate, the lower leaves petiolated, the upper sessile, and sometimes embracing the stem at the base. *Inflorescence* terminal sub-corymbose clusters, its branches with numerous linear bractes. *Involucre* cylindrical, its scales lanceolate, with a pale membranous margin, the outer ones half as long, spreading, linear lanceolate. *Florets* numerous, those of the ray with an oblong spreading limb, entire, or three toothed, those of the disk tubular, five

toothed. *Fruit* oblong, rough, with short pubescence. *Pappus* white, rough, silky.

Habitat.—Hedges, road sides, and waste places in England; frequent in a sandy soil. Woodhall, near Airdrie, and Auton's-hill, near Coldstream, and Swinton, Scotland.

Perennial; flowering in July and August.

6. *S. Jacobæ'a*, Linn. (Fig. 1289.) *Common Ragwort*. Leaves smooth, the radical ones petiolated, obovate, lobed towards the base, the upper sessile, auriculated, embracing the stem, bi-pinnatifid, with narrow toothed lobes, branched above, corymbose; ray oblong, toothed, spreading; fruit of the disk rough, hairy, of the ray smooth.

English Botany, t. 1180.—English Flora, vol. iii. p. 436.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 146.

Root fleshy, with long branched fibres. *Stem* erect, from two to three feet high, more or less branched and leafy, smooth, or clothed with close downy pubescence, round, furrowed. *Leaves* quite smooth, or downy, alternate, the lower ones with long footstalks, obovate, lobed towards the base in a somewhat lyrate manner, the upper ones deeply cut into numerous narrow entire toothed or bifid segments, spreading, auriculated at the base, and embracing the stem. *Inflorescence* terminal corymbs of numerous crowded golden yellow flowers, the peduncles more or less cottony. *Involucre* hemispherical, its scales linear, tipped with black. *Florets* numerous, those of the ray with a linear oblong spreading limb, three toothed at the end, those of the disk tubular, five toothed. *Fruit* ovate, of the disk rough, with short hairs, of the ray smooth. *Pappus* short, soon falling away.

Habitat.—Open pastures, road sides, and waste places; common.

Perennial; flowering in July and August.

This is the most common and troublesome of the genus to the farmer. It will, from its fleshy roots and long penetrating fibres, sustain a long period of dry weather, and is green, long after the other herbage around it is withered; it is not, however, except from great scarcity, ever fed upon by cattle. When bruised it has a fœtid unpleasant smell, and has been, under the name of Swine's Cress, applied in the form of poultice to cancers. It is in many parts of the country still used as an ingredient in poultices to inflamed or gathered breasts, but without any advantage, over a simple poultice of bread and milk.

7. *S. aquaticus*, Huds. (Fig. 1290.) *Marsh Ragwort*. Leaves smooth, the radical ones petiolated, oblong, entire, or lobed at the base, the upper lyrate-pinnatifid, sessile, branched above, corymbose, lax; involucre hemispherical; ray oblong, toothed, spreading; fruit all smooth.





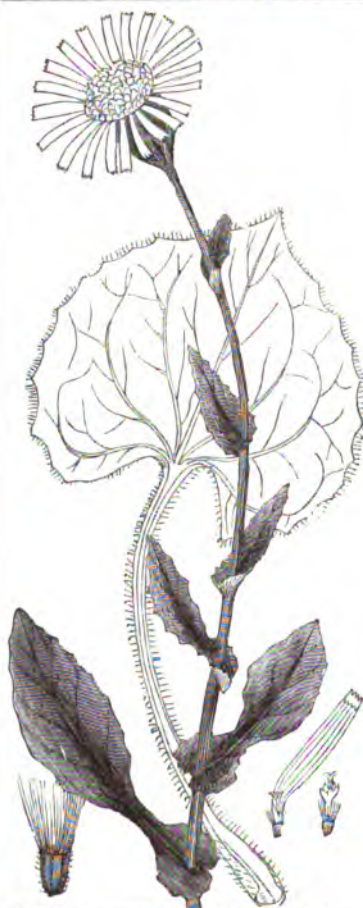
1291

Senecio paludosus.



1292

Senecio saracenicus.



1293

Doronicum Pardalianches.



1294

Doronicum plantaginicum.

English Botany, t. 1131.—English Flora, vol. iii. p. 435.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 146.

Root fleshy, with long fibres. *Stem* erect, three to four feet high, round, smooth, striated, branched, often purplish. *Leaves* distant, smooth, rarely slightly cottony, the lower ones mostly with long petioles, oblong, toothed, or lobed towards the base, the upper sessile, or with short footstalks, mostly lobed in a lyrate manner, the lateral segments linear, obtuse, toothed, the terminal lobe large, ovate, toothed. *Panicle* terminal, of few rather large golden yellow flowers. *Involucre* of lanceolate obtuse scales, the outer ones very short, smooth, or cottony. *Florets* numerous, golden yellow, those of the ray with an oblong spreading lip, three toothed at the end, those of the disk tubular, five toothed. *Fruit* oblong, angular, smooth, *pappus* short, soon falling away.

Habitat.—Marshy places, banks of rivers, &c.; frequent.

Perennial; flowering in July and August.

**** *Flowers rayed, leaves undivided*

8. *S. paludosus*, Linn. (Fig. 1291.) *Great Fen Ragwort*. Leaves sessile, lanceolate, taper pointed, acutely serrated, somewhat woolly beneath; stem erect, hollow; corymb terminal, spreading; bractæas awl-shaped; fruit downy.

English Botany, t. 650.—English Flora, vol. iii. p. 435.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 146.

Root of numerous long stout fibres. *Stem* erect, straight, round, furrowed, hollow, simple below, branched above, from four to six feet high, smooth, or loosely cottony. *Leaves* numerous, sessile, smooth, bright green above, pale and more or less cottony beneath, all lanceolate, sessile, more or less taper pointed, and sharply serrated, the upper ones contracted at the base, the lower dilated, and embracing the stem. *Inflorescence* terminal loose panicle of few large golden yellow flowers. *Involucre* hemispherical, nearly smooth, its scales linear, obtuse, the outer ones about half as long. *Florets* numerous, linear, oblong, finely toothed at the end, those of the ray small, linear, the limb five toothed. *Fruit* oblong, somewhat angular, clothed with fine downy pubescence. *Pappus* short, rough, fragile.

Habitat.—Ditches and marshes; rare. Suffolk, Lincolnshire, and Cambridgeshire.

Perennial; flowering in June and July.

9. *S. Saracenicus*, Linn. (Fig. 1292.) *Broad-leaved Groundsel*. Leaves smooth, oblong lanceolate, acute, sessile, unequally serrated; stem erect, solid, smooth; corymb terminal, of few flowers; bractæas linear lanceolate; fruit smooth.

English Botany, t. 2211.—English Flora, vol. iii. p. 436.—Hooker, British Flora, ed. 4. vol. i. p. 305.—Lindley, Synopsis, p. 146.

Root creeping. *Stem* erect, from three to five feet high, round,

smooth, furrowed, scarcely branched, terminating in a corymb of not very numerous flowers. *Leaves* scattered, sessile, smooth, scarcely paler beneath than above, lanceolate, serrated, unequally, the teeth small, glandular, tipped, and more or less recurved, the upper ones sessile, with a broad base, the lower ones narrowed into a winged footstalk. *Flowers* bright yellow. *Involucers* of lanceolate black pointed scales, smooth, or slightly downy, the outer ones few, half as long as the inner. *Bracteas* linear lanceolate. *Florets* of the ray few, with a broad oblong obtuse veiny limb, toothed at the end, of the disk tubular, five toothed. *Fruit* short, oblong, angular, smooth. *Pappus* white, long, rough.

Habitat.—Moist meadows and pastures in several parts of England and Scotland, but very local, and probably often the outcast from gardens.

Perennial; flowering in July and August.

The specific name *Saracenicus* is given to the plant in reference to its having been used by the Saracens for the cure of wounds, ulcers, &c. It has not, however, obtained any celebrity in modern times for vulnerary properties, and is not in any way used.

GENUS XXXIX. TUSSILA'GO—LINN. *Colt's-foot*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* formed of a single row of linear scales, membranous on the margin. *Florets* yellow, those of the ray long, narrow, numerous, imperfect, of the disk few, perfect. *Receptacle* naked. *Pappus* hairy.—Name altered from *tussis*, a cough; in allusion to the plant being used for the cure of coughs.

1. *T. Farfara*, Linn. (Fig. 1293.) *Colt's-foot*. Scape single flowered, imbricated, with scales; leaves heart-shaped, toothed, white and woolly beneath.

English Botany, t. 429.—English Flora, vol. iii. p. 426.—Hooker, British Flora, ed. 4. vol. i. p. 303.—Lindley, Synopsis, p. 147.

Root fibrous, with long fleshy creeping underground stems. *Flowers* appearing before the leaves, solitary, terminating a round white cottony scape, about a foot high, simple, scattered over with oblong lanceolate membranous scales, mostly of a purplish colour, the bud drooping, erect when in flower. *Involucers* of oblong obtuse membranous scales, with a few smaller ones at the base. *Florets* numerous, those of the ray crowded, with a narrow linear spreading limb, those of the disk few, tubular, five-cleft. *Pappus* long, white, silky, spreading. *Leaves* angular, heart-shaped, more or less unequally toothed on the margin, nearly smooth, or slightly covered over with a

cobweb pubescence above, beneath clothed with a thick white woolly coat, petiole long, channeled, striated, dilated, and somewhat sheathing at the base.

Habitat.—Moist waste places, especially in a clayey soil; very common.

Perennial; flowering in March and April.

The dried leaves cut and smoked like tobacco are considered useful in some kinds of coughs and asthma; and an infusion made into syrup, with sugar or honey, is said to be useful for the same affections. The thick cottony substance of the leaves, when impregnated with saltpetre, forms an excellent tinder.

GENUS XL. DORON'ICUM.—LINN. *Leopard's-bane*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involutum* hemispherical, or flat, its scales equal, in a double row. *Florets* yellow, those of the ray ligulate, five toothed. *Receptacle* naked. *Pappus* hairy, wanting on the marginal florets. *Fruit* sulcated.—Name from *δωρον*, a gift: and *νικη*, victory; because it is said to have been formerly used to destroy wild beasts.

1. *D. Pardalian'ches*. Linn. (Fig. 1294.) *Great Leopard's-bane*. Leaves heart-shaped, toothed, the lower and radical ones with long naked footstalks, the upper ones with the petiole dilated into broad ears at the base, and embracing the stem, the uppermost ones oblong, sessile, embracing the stem; stolons elongated, sessile, thick, and fleshy at the end.

English Botany, t. 2654.—Hooker, British Flora, ed. 4. vol. i. p. 807.—Lindley, Synopsis, Suppl. p. 325.—English Flora, vol. iii. p. 447.

Root with creeping stolons, forming oblong fleshy tubers at the end, from which the stem and other stolons arise, and spread around. *Stem* erect, about three feet high, simple, or sometimes branched above, round, striated, leafy, and slightly hairy. *Leaves* somewhat downy, bright green above, pale beneath, the lower and radical ones broadly heart-shaped, waved and toothed on the margin, on long slender channeled footstalks, the intermediate leaves ovate, with a dilated petiole, auriculated at the base, and embracing the stem, the upper leaves oblong lanceolate, sessile, and embracing the stem. *Flowers* terminal, solitary, bright yellow, about two inches across. *Florets* numerous, those of the ray with a rather long linear spreading lip, entire, or three toothed at the end, those of the disk tubular, five toothed. *Involute* downy, of linear awl-shaped scales. *Fruit* oblong, furrowed, those of the ray without pappus, or only a few

hairs, those of the disk downy, with the *pappus* erect, simple rough hairs.

Habitat.—Moist woods; Catton by Norwich; Mountains of Northumberland; Dan of Dupplin, and Dalkeith Park, &c., Scotland.

Perennial; flowering in June and July.

This species, which is not unfrequent on the mountains in the North of Italy and other mountainous parts of the Continent, appears a doubtful native of Britain. The whole plant is mostly, but not constantly, except in the upper part, clothed with a clammy pubescence.

2. *D. plantagin'eum*, Linn. † (Fig. 1295) *Plantain-leaved Leopard's-bane*. Leaves ovate, toothed, the radical ones rounded or heart-shaped at the base, upper ones with the petiole dilated, eared at the base, and embracing the stem, the uppermost ones sessile, ovate acuminate, embracing the stem; rhizoma short; stolons none.

Hooker, British Flora, ed. 4. vol. i. p. 307.—Lindley, Synopsis, p. 325.—English Botany, under. t. 2654, and *D. Pardalianches*, t. 680.—English Flora, p. 447.—*D. scorpioides*, Willd.

Root a fleshy rhizoma, with fibrous roots, and from which the stems and leaves arise. *Stem* erect, from two to three feet high, round, striated, somewhat downy and clammy, simple or branched above. *Leaves* more or less hairy, soft and pliant, unequally waved, and obtusely toothed on the margin, the radical ones ovate, with the base heart-shaped, or rounded, and running down a little on each side of the long petiole, those at the base of the stem with a short dilated petiole, or sessile, and embracing the stem, the upper ones with a more tapering point. *Flowers* larger than the last species, bright yellow, solitary, terminating the stem and branches. *Involucre* nearly smooth, its scales long, narrow, awl-shaped. *Florets* numerous, those of the ray long, linear, obtuse, or toothed at the end, spreading, of the disk short, tubular, the limb five-cleft. *Fruit* oblong, somewhat downy, those of the ray without pappus, those of the disk with short erect rough pappus.

Habitat.—Salinghall and Widdington, Essex; Burry Hill, near Mansfield, Nottinghamshire.—*R. D.* Saline, Fifeshire; and Cleish.—*Dr. Dewar*.

Perennial; flowering in June and July.

GENUS XLI. BEL'LIS.—LINN. *Daisy*.

Nat. Ord. COMPOSITÆ.

GEN. CHAR. *Involucrum* hemispherical, simple, of numerous obtuse lanceolate scales. *Florets* of the ray ligulate, imperfect. *Receptacle* conical, naked. *Pappus* none.—Named from *bellus*, pretty; in allusion to the modest beauty of the flower.



1295

Tussilago farfara.



1296

Bellis perennis.



1297 *Chrysanthemum leucanthemum*



1298 *Chrysanthemum parthenium.*



1299

Chrysanthemum inodorum



1300

Chrysanthemum inodorum, var. β .

1. *B. peren'nis*, Linn. (Fig. 1296.) *Common Daisy*. Scape single flowered; leaves spatulate, obovate, crenated; root creeping.

English Botany, t. 424.—English Flora, vol. iii. p. 448.—Hooker, British Flora, p. 307.—Lindley, Synopsis, p. 148.

Root of numerous long branched fibres, branched, and somewhat creeping at the crown. *Leaves* numerous, all radical, depressed, obovate, spatulate, somewhat hairy, the margin entire, or more or less crenated. *Scape* erect, from two to four inches high, round, slender, hairy, single flowered, the base is sometimes branched, and bears one or a few leaves. *Involucre* downy, its scales linear, obtuse. *Florets* numerous, those of the ray with a long ligulate lip, obtuse, entire, or notched at the end, white, or more or less tinged, of a delicate pink, those of the disk short, tubular, yellow, the limb five-cleft. *Receptacle* cone-shaped, hollow. *Fruit* obovate, compressed, smooth.

Habitat.—Pastures and meadows everywhere.

Perennial; flowering from early spring to the end of summer.

By cultivation the florets of the disk expand into ligulate corollas, like those of the ray, and form a pretty button-like flower, which in cottage gardens is much used for forming a border to the beds. The heads also by cultivation become proliferous: the parent head has a number of smaller ones on short stalks spreading around it, the expansion of some of the florets of the disk. Though so common a plant in meadows and pastures, it appears to be refused by most cattle.

The Daisy, or *Day's-eye*, is one of the most simple and unobtrusive of our wild flowers, yet none has received more tributes of praise, or given birth to more poetical effusions. Chaucer, the "Father of English Song," in his rural enjoyments, so truly descriptive of rural scenes, and the feelings of an unsophisticated heart, amid the untutored, unchanged, and unchanging works of nature, thus speaks of the Daisy—

"— Now have I then eke this condition,
That above all the flow'res white and red,
Such that men call Daisies in our town:
To them I have so great affection,
As a sad erst, when comen is the May,
That in my bed there dawneth me no day,
That I n' am up and walking in the mead,
To see this flower against the son 'ne spread."

And Wordsworth, "Nature's Poet," who has not passed over the little gem without giving its meed of praise, says, from its being so generally distributed—

"Bright flower, whose home is everywhere!
A Pilgrim bold in Nature's care,

And oft, the long year through, the heir
 Of joys or sorrows,
 Methinks that there abides in thee
 Some concord with humanity,
 Given to no other flower I see
 The forest through."

And Montgomery seems to have a similar feeling with reference to the wide-spread abode of the plant, he says—

"O'er waste and woodland, rock and plain,
 Its humble buds unheeded rise ;
 The Rose has but a summer reign—
 The Daisy never dies."

Mason Good elevates the little flower to exemplify the works and the presence of God in its construction—

"Not worlds on worlds in phalanx deep,
 Need we to prove a God is here ;
 The Daisy, fresh from winter's sleep,
 Tells of his hands in lines as clear.
 For who but He who arch'd the skies,
 And pours the day spring's living flood,
 Wonderous alike in all He tries,
 Could raise the Daisy's purple bud :
 Mould its green cup, its wiry stem,
 Its fringed border nicely spin,
 And cut the gold embossed gem,
 That set in silver gleams within :
 And fling it unrestrained and free,
 O'er hill and dale, and desert sod,
 That man, where'er he walks may see
 In every step the stamp of God !"

GENUS XLII. CHRYSAN'THEMUM.—LINN. *Ox-eye, Fever-feu-*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involuorum* hemispherical, or flat, the scales imbricated, membranous on the margin. *Florets* of the circumference ligulate, with a compressed tube. *Receptacle* naked. *Fruit* without pappus, or crowned with a membranous margin.—Name *χρυσος*, gold ; and *αυθος*, a flower ; so called in allusion to the golden coloured flowers of some of the species.

* *Florets of the ray white.*

1. *C. Leucanthemum*, Linn (Fig. 1297.) *Great White Ox-eye*
 Leaves oblong, obtuse, crenate, pinnatifid at the base, the radical ones obovate, petiolated ; stem erect, branched.

English Botany, t. 601.—English Flora, vol. iii. p. 460.—Hooker, British Flora, ed. 4. vol. i. p. 807.—Lindley, Synopsis, p. 148.

Root somewhat woody, with numerous long branched fibres. *Stem* erect, simple, or branched upwards, angular, furrowed, about two feet high, scattered over with compressed hairs. *Leaves* numerous, smooth, or nearly so, the radical ones obovate, deeply crenated, on long slender footstalks, the intermediate ones obovate oblong, crenated, petiolated, and cut at the base, the upper ones oblong, obtuse, sessile, and embracing the stem, crenated above, cut in a pinnatifid manner at the base. *Flower* solitary, terminal, large. *Involucre* linear oblong, obtuse, with a narrow brown membranous margin. *Florets* very numerous, those of the ray with an oblong white spreading lip, entire, or toothed at the end, those of the disk yellow, tubular, the limb five-cleft. *Receptacle* flat. *Fruit* obovate, black, with white elevated ribs.

Habitat.—Dry pastures and waste places; frequent.

Perennial; flowering in June and July.

The large white rays of the flowers around the bright yellow disk render this not an inelegant plant. It has been used as an expectorant and diuretic, but its medicinal properties are so slight as to render it unimportant.

2. *C. Parthenium*, Pers. (Fig. 1298.) *Common Fever-few*. Leaves downy, petiolated, bi-pinnatifid, the segments elliptic oblong, obtuse, toothed; stem branched, corymbose; involucre downy; fruit with terminal acute margin.

Lindley, Synopsis, p. 148.—*Pyrethrum*, Smith.—English Botany, t. 1281.—English Flora, vol. iii. p. 452.—Hooker, British Flora, ed. 4. vol. i. p. 307.

Root tapering. *Stem* erect, round, striated, about two feet high, leafy, branched. *Leaves* finely downy, bi-pinnatifid, petiolated, dark green above, pale beneath, the segments elliptic oblong, obtuse, the lobes oblong, toothed. *Inflorescence* terminal sub-corymbose clusters of distant flowers. *Flowers* rather small. *Involucre* more or less downy, its scales oblong, obtuse, with a narrow membranous margin. *Florets* of the ray white, the limb short, ovate, obtuse, entire, or toothed at the end, those of the disk yellow, tubular, the limb five toothed. *Receptacle* flattish. *Fruit* oblong, furrowed, crowned with a narrow membranous margin.

Habitat.—Waste places and under hedges; not unfrequent.

Biennial; flowering in June and July.

The leaves of the common Fever-few have, when bruised, a strong pungent odour and a bitter taste; they are commonly used by the country people for making tea, which is given as a tonic after fevers, inflammations, &c., and a strong infusion is thought to be very useful as a stimulant to hysterical people. In Italy it is the common

practice to put it in the rooms and on the beds of women after their confinements ; and it is considered valuable in preventing the accession of fever.

3. *C. inodo'rum*, Linn. (Fig. 1299.) *Corn Fever-few, or Scentless Mayweed*. Leaves sessile, bi- or tri-pinnatifid, the segments capillary ; stem branched, spreading ; receptacle hemispherical ; fruit with an entire border.

Lindley, Synopsis, p. 148.—*Pyrethrum*.—English Botany, t. 676—English Flora, vol. iii. p. 453.—Hooker, British Flora, ed. 4. vol. i. p. 807.

β. maritimum. (Fig. 1800.) Leaves more fleshy, stem more spreading.

Matricaria maritima, Linn.—*Pyrethrum*, Smith.—English Botany, t. 979.—English Flora, vol. iii. p. 453.

Root tapering, the whole plant almost without odour. *Stem* angular, striated, branched and spreading, smooth. *Leaves* sessile, bi- or tri-pinnatifid, the segments bristle-shaped, terminating in a small fine point. *Flowers* rather large, terminal, on naked peduncles. *Involucre* scales oblong, obtuse, with a thin brown membranous margin. *Florets* numerous, those of the ray with a long linear obtuse entire or toothed limb, spreading, white, veiny, those of the disk tubular, yellow, five-cleft. *Receptacle* hemispherical, or conical, naked. *Fruit* oblong, angular, crowned with a narrow entire membranous border.

Habitat.—Cultivated fields, road sides ; common, especially in a gravelly soil ; *β.* near the sea.

Annual ; flowering in August and September.

** *Florets all yellow.*

4. *C. sege'tum*, Linn. (Fig. 1301.) *Corn Marigold, Yellow Ox-eye*. Leaves glaucous green, the upper ones trifid, toothed, sessile, and embracing the stem, the lower petiolated ; fruit with an obsolete margin.

English Botany, t. 540.—English Flora, vol. iii. p. 451.—Hooker, British Flora, ed. 4. vol. i. p. 307.—Lindley, Synopsis, p. 148.

Root small, tapering, the whole plant smooth, of a glaucous green. *Stem* erect, striated, round, more or less branched, about a foot high. *Leaves* numerous, oblong lanceolate, three-cleft, or variously cut and toothed, sessile, and embracing the stem, the radical ones much longer, with a somewhat winged petiole. *Flowers* numerous, rather large, a bright golden yellow, solitary, terminal, the peduncle swollen upwards. *Involucre* with oblong obtuse scale, having a broad thin brown membranous margin. *Florets* numerous, all yellow, those of the ray with an obovate obtuse notched or toothed spreading limb, those of the disk small, tubular, five-cleft. *Receptacle* convex. *Fruit* obovate, compressed, grooved, smooth.





1301 *Chrysanthemum segetum.*



1302 *Matricaria chamomilla.*



1303 *Anthemis maritima.*



1304 *Anthemis nobilis.*



1305 *Anthemis arvensis.*



1306 *Anthemis cotula.*

Habitat.—Corn fields; frequent.

Annual; flowering from June to August.

This, though a very common field flower, is very handsome, and would form a pretty showy ornament of the garden border.

GENUS XLIII. MATRICARIA.—LINN. *Wild Chamomile*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* hemispherical, or flat, the scales obtuse, without a membranous margin. *Florets* of the circumference ligulate, with a compressed tube. *Receptacle* naked, conical. *Pappus* wanting.—Named from its reputed medicinal properties.

1. *M. Chamomilla*, Linn. (Fig. 1802.) *Wild Chamomile*. Leaves smooth, bi-pinnatifid, with capillary segments; involucre nearly flat, the scales obtuse.

English Botany, t. 1282.—English Flora, vol. iii. p. 455.—Hooker, British Flora, ed. 4. vol. i. p. 308.—Lindley, Synopsis, p. 148.

Root tapering. *Stem* erect, about a foot high, smooth, striated, mostly much branched. *Leaves* numerous, sessile, embracing the stem, smooth, deep green, the upper ones simply pinnate, the rest doubly pinnatifid, all with hair-like segments, spreading. *Flowers* solitary, terminating the stem and branches. *Involucre* flat, the scales smooth, oblong, obtuse, without any membranous margin. *Florets* of the ray white, the limb oblong, obtuse, entire, or toothed at the end, those of the disk short, tubular, yellow, five-cleft. *Receptacle* conical, hollow, naked. *Fruit* angular, obliquely ovate, smooth.

Habitat.—Corn fields and waste places; frequent.

Annual; flowering in August.

The whole plant has much the appearance of the common Chamomile, and the flowers have somewhat the same kind of odour. Its naked conical receptacle, however, readily distinguishes it from the Anthemis.

GENUS XLIV. ANTHEMIS.—LINN. *Chamomile*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* hemispherical, or flat, its scales with a membranous margin, imbricated. *Florets* of the circumference ligulate, imperfect. *Receptacle* convex, paleaceous. *Fruit* crowned with a more or less prominent margin.—Named *αριθμός*, a flower; from the profusion of its heads.

* *Florets of the ray white*.

1. *A. maritima*, Linn. ? (Fig. 1303.) *Sea Chamomile*. Leaves bipinnatifid, acute, somewhat fleshy, minutely dotted, slightly hairy; stem prostrate; receptacle convex, its scales prominent between the florets, sharp pointed; fruit with a very narrow border.

English Botany, t. 2370.—English Flora, vol. iii. p. 456.—Hooker, British Flora, ed. 4. vol. i. p. 308.—Lindley, Synopsis, p. 150.—*A. Anglica*, Spreng sys. De Cand. Prod. 6. p. 10.

"Stems prostrate, a span long, angular, branched, hoary, with loose cottony down, sometimes purplish. Leaves sessile, fleshy, loosely hairy, especially beneath, deeply cut into many sharp pinnatifid segments, flat, bright green, marked with depressed dots on the upper side. Flowers terminal, solitary, on furrowed, hairy, or cottony stalks. Involucre hairy, its inner scales elongated, torn, and almost feathery, outer ones acute, much shorter. Disk convex, not conical, bright lemon coloured, the points of the (paleaceous) scales of the same colour, visible between the florets, especially before the latter expand. Florets of the ray numerous, cream coloured, the limb oblong, three toothed, horizontal. Stigmas in the florets of the disk at least deeply cloven. Fruit oblong, crowned with an extremely narrow entire border."—Smith.

Habitat.—Sea coast; Sunderland, Durham, Bear-Haven, S.W. of Ireland.

Annual; flowering in July.

2. *A. nobilis*, Linn. (Fig. 1304.) *Common Chamomile*. Leaves bipinnate, pubescent, the segments linear, subulate; stem prostrate; receptacle conical, its scales membranous, oblong; fruit somewhat triangular, smooth.

English Botany, t. 980.—English Flora, vol. iii. p. 457.—Hooker, British Flora, ed. 4. vol. i. p. 457.—Lindley, Synopsis, p. 150.

Root fibrous. Stem prostrate, when cultivated more erect, from twelve to eighteen inches high, round, furrowed, branched, downy. Leaves numerous, bi-pinnatifid, somewhat hairy, or smooth, the segments linear, awl-shaped, mostly bristle pointed. Flowers terminal, solitary, mostly several on each plant. Florets of the ray with an oblong white spreading limb, three toothed at the end, those of the disk yellow, small, numerous, tubular, five toothed. Receptacles conical, hollow, the paleaceous scales oblong, pointed, membranous, not so long, or about the length of the florets. Involucre of oblong obtuse scales, with a broad thin membranous margin, somewhat downy. Fruit somewhat triangular, crowned with an obscure border.

Habitat.—Dry gravelly pastures and waste places in various parts of England; Isles of Cumbrae and Bute, Scotland; Kerry, Ireland.

Perennial; flowering in August.

This, the common or Roman Chamomile, is one of the best and most generally used household tonics; and when taken in the form

of an infusion, combined with a small quantity of Epsom salts, is one of our best stomachic aperients; or in many cases of heartburn or acidity of the stomach, if taken with half a teaspoonful of carbonate of soda, is extremely useful. As a fomentation the decoction is used, or what is much better, the flowers themselves boiled in a flannel bag, and then pressed dry as can be, and applied to inflamed breasts, &c., are a most valuable remedy. The florets of the disk by cultivation expand in the same form as those of the ray, in which state they look better, but lose in their quality as a medicine what they gain in appearance. The single wild flowers are much stronger.

3. *A. arvensis*, Linn. (Fig. 1305.) *Corn Chamomile*. Leaves bipinnatifid, pubescent, the segments linear lanceolate, entire, or toothed, bristle pointed; stem erect, branched; receptacle conical, its scales lanceolate, bristle pointed, membranous; fruit obtusely quadrangular, crowned with an entire pappus.

English Botany, t. 602.—English Flora, vol. iii. p. 458.—Hooker, British Flora, ed. 4 vol. i. p. 308.—Lindley, Synopsis, p. 150.

Root tapering, and fibrous. Stem erect, from one to two feet high, much branched, striated, more or less clothed with soft loose pubescence. Leaves all sessile, bi-pinnatifid, its segments narrow, linear lanceolate, entire, or toothed. the points short, bristly, all more or less clothed with soft spreading pubescence. Flowers numerous, solitary upon the ends of the stem and branches, the peduncles very downy at the top. Involucre downy, its scales oblong, obtuse, with a narrow membranous margin. Florets very numerous, those of the ray with an oblong obtuse entire or toothed limb, white, spreading, becoming reflexed, those of the disk yellow, short, tubular, the limb five cleft. Receptacle conical, its scales membranous, lanceolate, bristle pointed, not so long as the florets, or as long. Fruit oblong, curved, obtusely quadrangular, sulcated, crowned with an entire membranous pappus.

Habitat.—Corn fields and waste places, especially in a sandy soil; very local in England; Dunfermline, near Edinburgh, and Linlithgow, Scotland; in the Phoenix Park, and near Lambeg, County of Down, Ireland.

Biennial; flowering in June and July.

The flowers of this plant, although pleasantly scented, are far from possessing the properties of *A. nobilis*.

4. *A. Co'tula*, Linn. (Fig. 1306.) *Stinking Chamomile*. Leaves bi-pinnatifid, smooth, the segments linear, entire, or toothed, bristle pointed; stem erect, branched; receptacle conical, its scales bristle-shaped; fruit rounded, striated, without pappus.

English Botany, t. 1772.—English Flora, vol. iii. p. 459.—Hooker, British Flora, ed. 4. vol. i. p. 308.—*Maruta fatida*, Cassini.—Lindley, Synopsis, p. 150.

Root tapering. *Stem* solitary, or several from the same root, erect, branched, bushy, smooth, striated, and often angular. *Leaves* all sessile, bright green, smooth, or somewhat hairy, rather fleshy, bipinnatifid, the segments narrow, linear, bristle pointed. *Flowers* terminating the stem and branches, solitary, the peduncles mostly somewhat downy beneath the flowers. *Involucre* smooth, or slightly downy, its scales oblong, obtuse, with a narrow membranous margin. *Florets* numerous, those of the ray with an oblong obtuse entire or toothed spreading white limb, of the disk small, yellow, tubular, five-cleft. *Receptacle* conical, its scales linear, bristle-shaped, about as long as the florets. *Fruit* roundish, obovate, striated and furrowed, the crown without pappus.

Habitat.—Corn fields and waste places; frequent.

Annual; flowering in June and July.

The whole plant has a strong acrimonious smell, and it is said blisters the hands of those who gather it from among growing corn &c. By the aid of a strong magnifying power it will be seen that the whole plant is studded over with small glands, which secrete the acrid oil.

* *Florets all yellow.*

5. *A. tinctoria*, Linn. (Fig. 1307.) *Ox-eye Chamomile*. Leaves bipinnatifid, downy, the segments pectinato-serrated; stem erect, branched; receptacle sub-hemispherical, its scales lanceolate, with a rigid bristle point; fruit quadrangular, striated, crowned with a narrow pappus.

English Botany, t. 1472.—English Flora, vol. iii. p. 460.—Hooker, British Flora, ed. 4. vol. i. p. 309.—Lindley, Synopsis, p. 150.

Root tapering. *Stem* erect, from one to two feet high, bushy, angular, smooth, or downy, especially above. *Leaves* sessile, bipinnatifid, green, and somewhat hairy above, white and downy beneath, the segments pectinated, with acute bristle pointed teeth, the rachis also toothed. *Flowers* large, bright yellow, numerous, terminal, the peduncles striated, naked, downy. *Involucre* downy, its scales lanceolate, thin, with a dark mid-rib, the margin especially of the inner ones fringed with a brown border. *Florets* numerous, those of the ray with an ovate oblong obtuse entire or toothed limb, spreading, those of the disk tubular, five-cleft. *Receptacle* hemispherical, with its scales membranous, lanceolate, having a hard awl-shaped point, as long or longer than the florets. *Fruit* oblong, quadrangular, compressed, striated, and crowned with a narrow membranous entire margin.

Habitat.—Stony mountainous places, rare. Banks of the river Tees, Durham; in Essex, and near Forfar, Scotland.

Perennial; flowering in July and August.

The flowers of this rare species of Anthemis are handsome and gay-



1307

Anthemis tinctoria.



1308

Achillea tomentosa.



1309

Achillea millefolium.



1310

Achillea ptarmica.



1311

Achillea ptarmica, β . serrata.



1312

Centaurea nigra.

looking, and would look well on a border. They remain a long time in perfection, and, according to Linnæus, afford a good yellow dye, and are much used in Sweden for that purpose.

GENUS XLV. ACHILLÆA.—LINN. *Yarrow*.

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* ovate, imbricated. *Florets* of the circumference from five to ten, its limb short, roundish. *Receptacle* flat, paleaceous. *Fruit* compressed, the apex simple, or crowned with a prominent margin.—Named after *Achilles*, who is said to have been the first to have discovered its healing properties.

* *Flowers yellow*.

1. *A. tomentosa*, Linn. (Fig. 1808) *Woolly Yellow Milfoil, or Yarrow*. Leaves villous, linear lanceolate, bi-pinnatifid, the segments linear, bristle-shaped, crowded; corymb repeatedly compound; ligule short, broad.

English Botany, t. 2532.—English Flora, vol. iii. p. 463.—Hooker, British Flora, ed. 4. vol. i. p. 309.—Lindley, Synopsis, p. 151.

Root somewhat woody, creeping, and fibrous. *Stem* about a foot high, curved at the base, becoming erect, angular, striated, woolly, simple. *Leaves* numerous, sessile, linear lanceolate, downy, pinnules of the radical and lower leaves three-partite, of the upper bifid, and the uppermost entire, all lanceolate, bristle pointed, and crowded. *Inflorescence* a terminal repeatedly compound many flowered crowded corymb. *Involucres* hemispherical, imbricated, its scales ovate, obtuse, with a narrow brown membranous margin. *Florets* all golden yellow, those of the ray fine, tubular, with a broad ovate entire or three toothed limb, spreading, those of the disk tubular, five cleft. *Receptacle* flat, its scales thin, membranous, ovate lanceolate.

Habitat.—Dry hilly pastures; Scotland, Spittle-hill, North-west of Balvie, Dumbartonshire, and near Paisley.

Perennial; flowering in August.

The whole plant, when rubbed, has a pleasant aromatic smell. It is hardy, and flourishes well on artificial rock work or dry banks, and is a very pretty showy looking plant.

** *Flowers white, or buff coloured*.

2. *A. Millefolium*, Linn. (Fig. 1809.) *Common Yarrow or Milfoil*. Leaves cottony, or nearly smooth, bi-pinnate, linear lanceolate, bi-pinnatifid, the segments linear, acute, bristle pointed, toothed; stem erect, furrowed; corymb repeatedly compound; ligule broadly ovate, short.

English Botany, t. 758.—English Flora, vol. iii. p. 463.—Hooker, British Flora, ed. 4. vol. i. p. 309.—Lindley, Synopsis, p. 151.

Root fibrous, and with long creeping reddish slender underground stems. *Stem* erect, from one to two feet high, angular, or round, striated, more or less clothed with loose silky pubescence, simple, or slightly branched. *Leaves* numerous, linear lanceolate in their outline, the radical ones petiolated, the rest sessile, more or less clothed with soft silky pubescence, sometimes nearly smooth, bi-pinnatifid, the segments narrow, linear, or ovate lanceolate, bristle pointed, more or less toothed. *Inflorescence* a terminal compound crowded many flowered corymb. *Flowers* white, pale, flesh coloured, or pink. *Florets* of the ray with a broad roundish ovate spreading toothed limb, those of the disk tubular, five-cleft. *Involucre* hemispherical, the scales ovate oblong, keeled at the back, and fringed on the margin with a narrow brown border. *Receptacle* flat, its scales lanceolate, membranous.

Habitat.—Meadows and pastures; abundant.

Perennial; flowering all summer.

The segments of the leaves are very variable in their width, and as well as the whole plant in being more or less clothed with a silky pubescence. The whole plant is astringent, and is used by the Highlanders of Scotland to make an ointment, which they say is very useful in drying up and healing old ulcers, wounds, &c. Its infusion also has been recommended in various diseases where astringents are indicated as being needed; but it has never obtained general use. Linnæus says that in the mining provinces of Sweden they infuse it in their beer during the fermentation, to increase its intoxicating effects.

3. *A. Ptarmica*, Linn. (Fig. 1310.) *Sneeze-wort* Yarrow. *Leaves* sessile, linear lanceolate, acuminate, sharply serrated, often cut at the base; flowers white.

English Botany, t. 757.—English Flora, vol. ii. p. 461.—Hooker, British Flora, ed. 4. vol. i. p. 309.—Lindley, Synopsis, p. 151.

β. *serrata*. (Fig. 1311) *Leaves* more deeply serrated, lacinated at the base; flowers buff coloured.

Hooker, British Flora, ed. 4. vol. i. p. 309.—*A. serrata*.—English Botany, t. 2531.—English Flora, vol. iii. p. 462.—Lindley, Synopsis, p. 151.

Root fibrous, and with creeping underground stems. *Stem* erect, about two feet high, somewhat angular, striated, smooth, or clothed with fine close down, leafy, and more or less branched. *Leaves* all sessile, linear lanceolate, acute, closely minutely and regularly serrated with acute bristle pointed teeth, at the base they are sometimes deeply out and minutely serrated. *Inflorescence* compound corymb of numerous crowded flowers, small. *Involucre* downy, the scales lanceolate, keeled, the margin with a narrow brown membranous margin, imbricated. *Florets* numerous, white, or buff, those of the ray with a broad ovate spreading obtusely toothed limb, those of the

disk tubular, five-cleft. *Receptacle* flat, the scales oblong, membranous, mostly fringed with fine hairs at the end. *Fruit* compressed, the margin dilated.

Habitat.—Moist banks, thickets, &c.; not uncommon. β . Matlock, Derbyshire.

Perennial; flowering in July and August.

The florets of the disk by cultivation become expanded into ligulate corollas, like those of the ray. The whole plant has a somewhat pungent flavour, exciting, when masticated, a profuse flow of saliva, and the dried leaves powdered and snuffed up the nose excite sneezing. The young leaves and stems are often mixed with spring salads, to give them a degree of pungency and warmth to the stomach.

ORDER III.

POLYGAMIA FRUSTRANEA.

(*Florets of the disk perfect and fertile, those of the circumference neuter.*)

GENUS XLVI. CENTAUREA.—LINN. *Knapweed, Blue-bottle.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Involucrum* imbricated, its scales leafy, membranous, or spiny. *Florets* of the circumference longer than those of the disk. *Receptacle* paleaceous, its scales much cut or jagged. *Pappus* hairy, or wanting. *Fruit* compressed.—So named because *Centaur Chiron* cured a wound in his knee, which he received from Hercules.

* *Involucre scales with a membranous jagged or fringed margin.*

1. *C. nigra*, Linn. (Fig. 1312.) *Black Knapweed*. Scales of involucre ovate lanceolate, with a dark brown or black margin, deeply fringed, the teeth capillary, very numerous; leaves rough, the lower angulato-dentate, or sub-lyrate, the upper lanceolate, entire, or toothed; heads with or without a ray; pappus very short, tufted.

English Botany, t. 278.—English Flora, vol. iii. p. 466.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root somewhat woody, and with long fibres. *Stem* erect, from one to two feet high, branched, angular, furrowed, rough. *Leaves* dark green, rough, with short rigid pubescence, the lower ones petiolated, deeply lobed in a lyrate manner, and often toothed, the upper ones lanceolate, entire, or somewhat toothed, sessile, and embracing the stem, or somewhat decurrent. *Flowers* terminal, solitary, the peduncles swollen upwards, deeply furrowed, and with several small leaves

close under the head. *Involucre* sub-globose, its scales numerous, imbricated, ovate lanceolate, pale and downy at the base, the point and margin smooth, membranous, dark brown, almost black, fringed with numerous very fine hair-like slender long teeth, the inner scales oblong, torn, or slightly fringed. *Florets* numerous, deep purple, long, slender, tubular, the limb cut into five narrow segments, those of the ray the same as the disk, or sometimes larger. *Receptacle* flat, its scales cut into numerous hair-like segments. *Fruit* oblong, downy, crowned with a tuft of short pale rough bristles.

Habitat.—Meadows and pastures; frequent.

Perennial; flowering from June to August.

The flowers with a ray are not common; sometimes the flowers are altogether white.

2. *C. Ja'oea*, Linn. (Fig. 1313.) *Brown radiant Knapweed*. Scales of involucre membranous, ovate, concave, pale brown, entire, lacerated or fringed; leaves rough, lanceolate, entire, or the lower ones remotely sinuated or pinnatifid; heads radiant; pappus very short, in a single row.

English Botany, t. 1678.—English Flora, vol. iii. p. 155.—Hooker, British Flora, ed. 4. vol. i. p. 309.—Lindley, Synopsis, p. 155.

Root somewhat woody, and with long fibres. *Stem* erect, about a foot high, rough, angular, furrowed, branched. *Leaves* light green, rough, with short rigid hairs, the radical ones petiolated, lanceolate, toothed or lobed, the upper ones lanceolate, or linear, sessile, entire, or sometimes with one or two small teeth. *Flowers* terminal, solitary, the peduncles swollen upwards, angular, deeply furrowed, and with several leaves close to the head. *Involucre* sub-globose, of numerous imbricated oblong scales, terminating in an oblong membranous pale brown lobe, various, jagged, or fringed, or with short teeth. *Florets* numerous, those of the ray large, spreading, radiant, pale crimson, those of the disk short, darker coloured, all with a long narrow tube. *Receptacle* flat, its scales cut into numerous hair-like segments. *Fruit* inversely conical, crowned with a simple row of short black hairs.

Habitat.—Hedges and waste places, Sussex; frequent in Angushire, Scotland; near Belfast, Ireland.

Perennial; flowering in August and September.

3. *C. Scabiosa*, Linn. (Fig. 1314.) *Greater Knapweed*. Scales of involucre ovate, downy, with a black triangular ciliated point; leaves rough, pinnatifid, the lobes lanceolate, with a callous top to the point; pappus black unequal rough hairs, as long as the compressed fruit.

English Botany, t. 56.—English Flora, vol. iii. p. 468.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root somewhat woody. *Stem* erect, about two feet high, branched, angular, striated, somewhat rough. *Leaves* numerous, dark green,



1313

Centaurea jacea.



1314

Centaurea scabiosa.



1315

Centaurea cyanus.



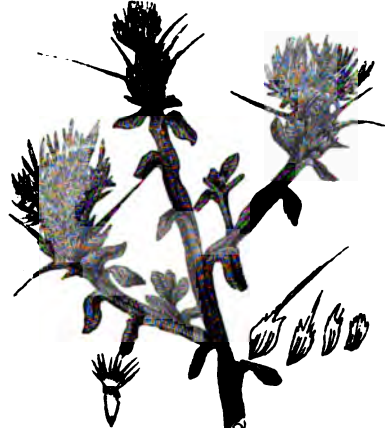
1316

Centaurea isardi.



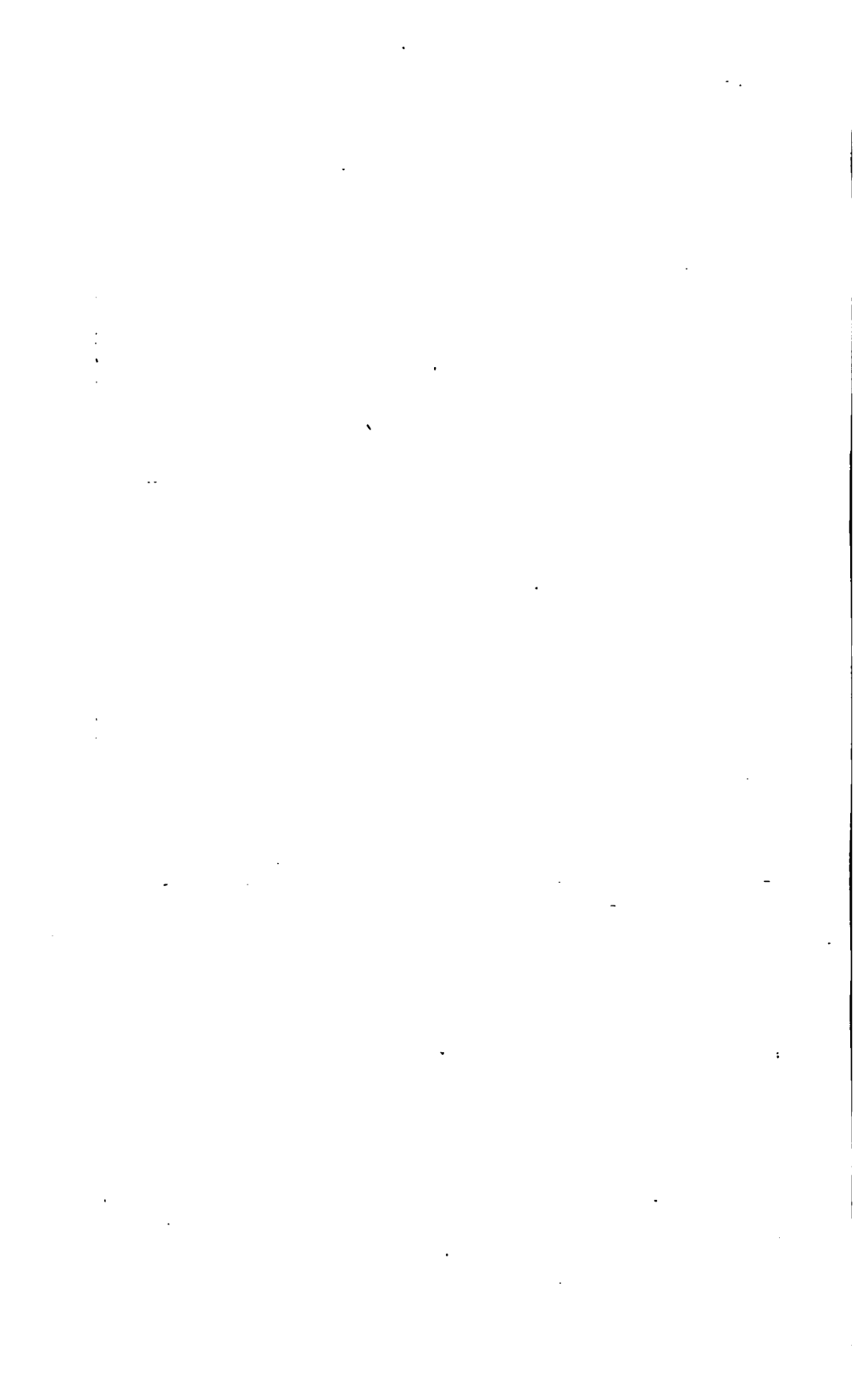
1317

Centaurea calcitrapa.



1318

Centaurea solstitialis.



roughish, especially on the edges, all pinnatifid or bi-pinnatifid, the segments lanceolate, or ovate, the apex with a small callous tip, and entire, or toothed. *Flowers* solitary, terminal, large, handsome, purple. *Involucre* sub-globose, downy, the scales imbricated, green, and ovate at the base, with a black triangular sub-membranous point, fringed on the margin with deep slender hairs. *Florets* numerous, those of the ray long, slender, tubular, with a large spreading five-cleft limb, those of the disk much shorter, and mostly darker purple. *Receptacle* flat, its scales cut into very numerous bristle-shaped segments, white, shining. *Fruit* oblong, compressed, a greyish brown, with a deep cavity on one side at the base, crowned with a *pappus* of dark brown rough unequal hairs.

Habitat.—Borders of corn fields, road sides, &c. ; frequent.

Perennial ; flowering in July and August.

The involucre scales, after the fruit has escaped, become reflexed, and as they are white and shining, they give the heads a singular silvery appearance.

4. *S. Cya'nus*, Linn. (Fig. 1315.) *Corn Blue-bottle*. Scales of involucre ovate, downy, the margin serrato-ciliated ; leaves linear lanceolate, entire, the lower ones toothed, and the radical ones obovate lanceolate, often trifid.

English Botany, t. 277.—English Flora, vol. iii. p. 467.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root tapering, and fibrous, the whole plant clothed with a loose cottony pubescence. *Stem* erect, from one to three feet high, angular, striated, branched. *Leaves* numerous, linear lanceolate, entire, or somewhat toothed, the lower ones often pinnatifid, and the radical ones obovate lanceolate, frequently three-cleft. *Flowers* numerous, solitary, terminal. *Involucre* roundish ovate, downy, its scales ovate, pale green, with a dark brown or pale toothed or ciliated membranous margin. *Florets* of the ray not very numerous, tubular, the limb much dilated, cleft, spreading, those of the disk dark purple, short, tubular, five-cleft, scarcely opened. *Receptacle* flat, its scales cut into numerous bristle-like segments. *Fruit* oblong, crowned with white rough unequal bristly hairs.

Habitat.—Corn fields ; frequent.

Annual ; flowering from July to August.

This pretty ornamental species is not uncommonly cultivated on the garden border, when the flowers become much larger, and are of various colours ; few plants in the wild state appear more beautiful than it does amongst the ripening corn. Its deep blue flowers are said to afford, simply by pressing out the juice and mixing with it a little alum, a beautiful fixed colour.

** *Involucre scales with a spinous margin*.

5. *S. Isnar'di*, Linn. (Fig. 1316.) *Jersey Star-thistle*. Scales of

involucre smooth, the margin with palmate spines; leaves rough, oblong lanceolate, toothed or pinnatifid; flowers terminal, solitary, with one or two leaves at the base.

English Botany, t. 2256.—English Flora, vol. iii. p. 468.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root fibrous. *Stems* mostly several, recumbent, about a foot long, branched, angular, furrowed, rough. *Leaves* scattered, sessile above, and somewhat clasping the stem, lanceolate, oblong, toothed, the lower ones petiolated, pinnatifid, the lobes lanceolate, tipped with a small spine, all roughish, especially on the edges. *Flowers* terminal, solitary, pale purple. *Involucre* globose, smooth, its scales ovate, green, tipped with five short yellow spreading spines, united in a palmate manner. *Florets* of the ray small, spreading, of the disk tubular, with a short limb. *Receptacle* flat, its scales cut into bristle-like segments. *Fruit* obovate, crowned with a tuft of unequally lengthened hairs.

Habitat.—Meadows and pastures in Jersey.

Perennial; flowering in July and August.

6. *C. Calcit'rapa*, Linn. (Fig. 1317.) *Common Star-thistle*. Scales of involucre smooth, terminating in a long stout broad spine, and fringed at the base with small ones; heads lateral, sessile, solitary; stem branched, spreading; leaves unequally pinnatifid, toothed, and spinous.

English Botany, t. 125.—English Flora, vol. iii. p. 469.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root tapering. *Stem* low, much and repeatedly branched and spreading, striated, furrowed, somewhat downy. *Leaves* numerous, sessile, hairy, a pale somewhat glaucous green, unequally pinnatifid, with lanceolate lobes, toothed, each tooth terminating in a slender spine, the upper leaves lanceolate, toothed, the lower ones petiolated. *Flowers* solitary, sessile, lateral, mostly surrounded with several leaves at the base. *Involucre* smooth, ovate, its scales ovate oblong, terminating in a long stout broad channeled spine, and fringed at the base with small ones. *Florets* pale pink, those of the ray rather larger than those of the disk. *Receptacle* flat, its scales cut into long slender white silky hairs. *Fruit* ovate, a pale grey, smooth, without pappus.

Habitat.—Gravelly and sandy waste places in the Middle and South of England, especially near the sea.

Annual; flowering in July and August.

7. *C. solstitialis*, Linn. (Fig. 1318.) *Yellow Star-thistle*, *St. Barnaby's thistle*. Scales of involucre woolly, palmato-spinous at the base, the terminal spine long, and slender; heads terminal, solitary; leaves lanceolate, decurrent, forming wings to the stem, the radical ones lyrato-pinnatifid, all unarmed.

English Botany, t. 243.—English Flora, vol. iii. p. 470.—Hooker, British Flora, ed. 4. vol. i. p. 310.—Lindley, Synopsis, p. 155.

Root tapering, the whole plant clothed with close woolly pubescence, somewhat glutinous, and intensely bitter. *Stem* erect, about two feet high, branched and spreading, slender. *Leaves* lanceolate, entire, small, decurrent, and forming uninterrupted wings to the stem, the radical leaves petiolated, lyrato-pinnatifid, with narrow lanceolate segments, toothed or jagged, the terminal one large, angular. *Flowers* terminal, solitary upon the ends of the stem and branches. *Involucre* globose, woolly, the scales on the margin furnished with slender bristly spines, the upper ones with the terminal one elongated into a long compressed channeled spine, often an inch in length. *Florets* yellow, or lemon colour, all tubular, the limb five cleft, those of the ray scarcely longer than those of the disk. *Receptacle* flat, its scales cut into slender bristle-like segments. *Fruit* obovate, smooth, pale grey, compressed. *Pappus* of unequal short rough hairs.

Habitat.—Fields and waste places, rare; chiefly in the East and South of England, and near Dublin.

Annual; flowering from July to September.

This is a doubtful native plant, having probably been introduced with corn or other grain from the Continent, where it grows in great abundance.

CLASS XX.

GYNANDRIA.

(*Stamens situated upon the style or column above the germen*).

ORDER I.

MONANDRIA. 1 STAMEN.

GENUS I. ORCHIS.—LINN. *Orchis*.

Nat. Ord. ORCHIDÆE. JUSS.

GEN. CHAR. *Sepals* and *petals* personate, ringent, *lip* lobed, and spurred at the base. *Pollen masses* with two glands, enclosed in a common pouch.—Name “an ancient appellation of the plant.”

* *Tubers* two, undivided. *Bractea* with one rib.

a. *Lip* three lobed, the lateral lobes shorter, or as long as the middle one.

1. *O. Mo'rio*, Linn. (Fig. 1819.) *Green winged Meadow Orchis*.
Lip three lobed, somewhat crenated, the middle lobe emarginate;

sepals ascending, obtuse, many ribbed, greenish, and with the petals connivent; spur sub-clavate, horizontal, or ascending, about as long as the ovarium.

English Botany, t. 2059.—English Flora, vol. iv. p. 11.—Hooker, British Flora, ed. 4. vol. i. p. 813.—Lindley, Synopsis, p. 260.

Tubers two, globose, one (the new tuber for the next year's plant) mostly attached to the old one by a short stalk. *Stem* from four to twelve inches high, clothed with leafy sheaths. *Leaves* oblong, lanceolate, a somewhat glaucous green, numerous ribbed. *Inflorescence* a terminal lax spike of few flowers. *Bractees* lanceolate, membranous, single, or sometimes at the base three ribbed, somewhat purple, as long as the ovarium. *Sepals* ovate, obtuse, pale, with numerous green ribs enclosing the petals, and with them forming a kind of helmet over the rest of the flower. *Lip* rather large, broad, reflexed, three lobed, the lateral lobes crenated on the margin, the middle one emarginate, purple, pale in the middle, with purple spots. *Spur* cylindrical, obtuse, or sub-clavate, about as long as the ovarium, curved upwards.

Habitat.—Meadows and pastures; frequent.

Perennial; flowering in May and June.

The lax spikes of flowers, the reflexed lip with its pale spotted disk and pale obtuse many ribbed connivent sepals, readily distinguish this from the other species of our orchises.

8. *O. mas'cula*, Linn. (Fig. 1320.) *Early Purple Orchis*. Lip deeply three lobed, somewhat crenated, the middle lobe emarginate, the base downy; sepals ovate oblong, obtuse or acuminate, the lateral ones three ribbed, at length reflexed; spur cylindrical, obtuse, horizontal, or ascending, as long as the ovarium.

English Botany, t. 631.—English Flora, vol. iv. p. 11.—Hooker, British Flora, ed. 4. vol. i. p. 813.—Lindley, Synopsis, p. 260.

Tubers large, globose. *Stem* erect, from twelve to eighteen inches high, partly clothed with leavy sheaths. *Leaves* radical, mostly marked with dark purple spots, elliptic lanceolate, smooth, shining, a fine green above, paler beneath. *Inflorescence* a terminal oblong lax spike of numerous purple somewhat fragrant flowers. *Bractees* membranous, single nerved, as long as the ovarium. *Sepals* ovate oblong, obtuse, acute, or acuminate at the point. *Lip* large, deeply three lobed, downy at the base, the lateral lobes mostly unequally crenated, the middle one notched, and often with a tooth in the angle of the notch. *Spur* cylindrical, obtuse, horizontal, or ascending, about as long as the ovarium, the sepals and petals are converged together, and form a kind of hood. *Cells* of the pollen masses close together, *pollen masses* yellow.

Habitat.—Groves, pastures, and meadows; frequent.

Perennial; flowering in April and May.



1319

Orchis morio.



1320

Orchis mascula.



1321

Orchis pyramidalis.



1322

Orchis fusca.

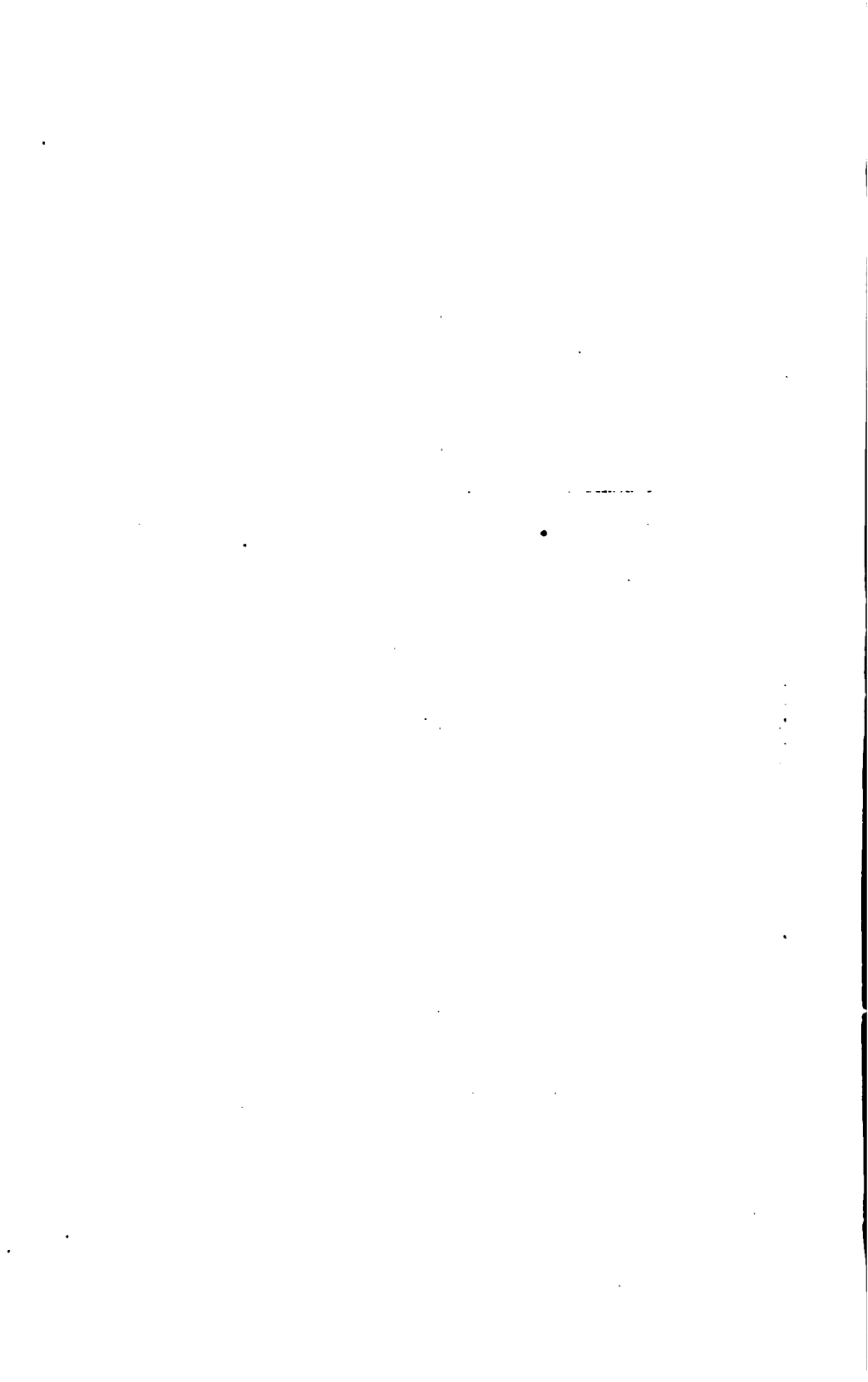


1323

Orchis militaris.



1324 *Orchis macra.*



The spikes of the flowers are extremely beautiful, mostly of a very dark purple colour, sometimes they are found pale, and occasionally white, and the sepals vary in being broader or narrower, and more or less acutely pointed. The tubers of this and several other species of *orchis* contain a large proportion of starch. The tubers are known in the shops by the name of *Salop*; they are said to be prepared by depriving them of their cuticle, and baking them in an oven for about twelve minutes, and afterwards more gradually dried in the sun. As an article of food it is similar in its properties to Sago and Arrow-root. *Salop* is chiefly brought from Persia, where, as in Turkey, it is highly esteemed as an article of food, and is said to contain more nutritious matter in the same bulk than any other known article; its portability and durability render it a favourite article of food with native pedestrians in deserted or thinly habited districts. It was formerly much used in England, but is now nearly out of use. In some parts of the country the flowers are called *Crow'sfoot*.

8. *O. pyramidalis*, Linn. (Fig. 1821.) *Pyramidal Orchis*. Lip with three equal entire lobes, with two protuberances at the base above; sepals ovate lanceolate, acuminate, the lateral ones spreading; spur slender, filiform, as long or longer than the ovary; pollen masses with one gland, each enclosed in a pouch; leaves linear lanceolate.

English Botany, t. 110.—English Flora, vol. iv. p. 10.—Hooker, British Flora, ed. 4. vol. i. p. 814.—*Anacamptis*, Rich.—Lindley, Synopsis, p. 261.

Tubers globose. *Stem* erect, a foot high or more, clothed with leafy sheaths. *Leaves* long, linear lanceolate, acuminate, a bright unspotted green. *Inflorescence* a terminal broad pyramidal spike of numerous crowded flowers, of a rich crimson, varying to a delicate pink or white. *Bractees* membranous, three ribbed at the base, as long as the ovary. *Sepals* ovate lanceolate, acute, the lateral ones spreading, *lip* reflexed, of three nearly equal entire obtuse lobes, near the base are two lamellar protuberances. *Spur* slender, awl-shaped, or filiform, about as long as the ovary, reflexed. *Pollen* masses united by one gland, but each enclosed in a single pouch.

Habitat.—Pastures, banks, and shady places, in a chalky or clayey soil in various parts of England; Isle of Colonsay, and in Fifeshire, Scotland; County of Dublin, and about Oldcastle, in the County of Cavan.

Perennial; flowering in July.

This species is readily distinguished by its pyramidal spike of flowers, its entire equal three lobed lip with its two protuberances near the base.

b. *Lip* deeply divided into three lobes, the middle one much the largest, often dilated and bifid, with a tooth in the fissure.

* *Tubers two, undivided. Bractea with one rib.*

4. *O. fus'cus*, Jacq. (Fig. 1322.) *Great Brown-winged Orchis*. Lip in three deep crenated lobes, scattered over with dark rough elevated points, the lateral lobes linear oblong, obtuse, shorter than the middle, large, obcordate, one notched, with a point in the angle; spur short, obtuse, reflexed; sepals ovate, acute, connivent, including the petals; bractea membranous, much shorter than the twisted ovarium; leaves large, oblong.

English Flora, p. 13.—Hooker, British Flora, ed. 4. vol. i. p. 313.—Lindley, Synopsis, p. 280.—*O. militaris*.—English Botany, t. 16.

Tubers large, oblong. *Stem* erect, from one to two feet high, leafy below, naked above. *Leaves* large, elliptic oblong, obtuse, or acutely pointed, three to six inches long, a bright green, numerously veined with parallel veins. *Inflorescence* a large terminal spike of numerous flowers. *Bractea* small, lanceolate, membranous, about one-fourth the length of the twisted ovarium, single ribbed. *Sepals* ovate, acute, a dark greenish purple, numerously veined and spotted, curved over the rest of the flower like a hood, including the petals. *Lip* large, reflexed, pale pink, more or less numerously studded with rough elevated spots of a deep purple colour, deeply cut into three lobes, the lateral ones narrow, linear, obtuse, much shorter than the middle broad obcordate one, which is notched in the middle with a tooth in the sinus. *Spur* short, obtuse, reflexed, about half as long as the ovarium. *Cells* of the pollen masses close together.

Habitat.—Chalky pastures and borders of woods in Kent.

Perennial; flowering in May.

This is the largest and most striking looking of all our Orchises, often growing above two feet high, with a spike of its large beautiful spotted flowers sometimes four inches long. The flowers exhale a strong peculiar odour, and the whole plant, when drying, and indeed for some time after, have the strong smell of the same kind as the *Asperula odorata*, or *Anthoxanthum odoratum*, which is depending upon the presence of Benzoic acid.

This very beautiful species of Orchis is much more common in the South of Italy than with us, growing to great perfection, and no mean ornament to the groves and shady pastures towards the end of April.

5. *O. Milita'ris*, Linn. (Fig. 1323.) *Military Orchis*. Lip in three deep lobes, scattered over with dark rough elevated points, the lateral lobes linear oblong, shorter than the middle dilated one, deeply cut with a point in the angle, the lobes divaricating, crenated at the end; spur reflexed, about half as long as the twisted ovarium; sepals ovate, taper pointed, connivent, including the petals; bractea membranous, much shorter than the ovarium; leaves oblong.

English Botany, t. 2675.—English Flora, vol. iv. p. 14.—Hooker, British Flora, ed. 4. vol. i. p. 313.—Lindley, Synopsis, p. 260.

Tubers large, oblong. *Stem* erect, from one to two feet high, leafy below, naked above. *Leaves* large, oblong lanceolate, or acute, numerous veined with parallel veins. *Inflorescence* a large terminal spike of numerous flowers, smaller than the last species. *Bractees* small, lanceolate, acute, single ribbed, membranous, scarce one-fourth the length of the twisted ovary. *Sepals* ovate, taper-pointed, pale, striated, and spotted with purple, curved over the rest of the flower like a hood, including the petals. *Lip* reflexed, deeply three lobed, purplish towards the ends, pale in the disk, with a dark central line and numerous small and larger rough elevated points, the lateral lobes narrow, linear, oblong, obtuse, the middle one dilated, and deeply cut into two spreading obtuse sometimes crenated lobes, with a point in the angle. *Spur* short, obtuse, sometimes notched, reflexed, much shorter than the twisted ovary.

Habitat.—Chalky pastures about Reading, on both sides of the River Thames.

Perennial; flowering in May.

This species is nearly allied to the last, but is readily distinguished from it by its paler taper pointed sepals, and its smaller lip divided into narrow segments. It exhales while drying the same odour as the last species, and though variable in size, is usually smaller in all its parts, the colour of its flowers much paler; and we find it much more frequent in various parts of the Continent, and usually in more open situations. It is very common in the grass-plots and the Campagna about Rome.

6. *O. ma'ora*, Lind. (Fig. 1824.) *Monkey Orchis*. Lip in three narrow linear segments, rough, with crystalline points, nearly hairless, the middle lobe deeply bifid, with a point in the angle; sepals ovate, taper pointed, connivent, including the petals; spur reflexed, about half as long as the twisted ovary; bractea short, acuminate, membranous; leaves ovate lanceolate.

Lindley, Synopsis, p. 260.—Hooker, British Flora, ed. 4. vol. i. p. 314.—*O. tephrosanthus*, Vill.—English Flora, vol. iv. p. 16.—*O. militaris*.—English Botany, t. 1873.—*O. militaris*, L. Linn.

Tubers oblong. *Stem* erect, from twelve to eighteen inches high, naked above, leafy below. *Leaves* oblong, acute, numerous, veined with parallel veins. *Inflorescence* a terminal ovate or oblong spike, often of few flowers, smaller than the last species. *Bractea* membranous, small, often with a long slender point. *Sepals* ovate, taper pointed, pale, with purple irregular veins, and dotted, converging like a hood, inclosing the petals. *Lip* reflexed, deeply three lobed, the segments purple, the disk pale, dotted, and covered with minute crystalline warts, the lateral lobes narrow, linear, shorter than the

middle one, which is deeply divided into two narrow spreading segments, with a tooth in the angle. *Spur* short, obtuse, reflexed.

Habitat—Chalk hills in Berks, Oxfordshire, and Kent.

Perennial; flowering in May.

This species is distinguished from the two last by the very narrow segments of the lip, and the whole plant being more slender and delicate in its appearance. In the name we have followed Lindley, who considers it quite a distinct species, and peculiar to Britain. We have, however, much doubt as to its being so: a species which we have always considered the same as ours grows very common in meadows and shady places about Rome, and is not unfrequent in various parts of the Continent; but as we have not been able to compare fresh specimens, we must for the present leave them as they now stand. *O. Simia*, Lam., we suspect is also the same plant.

7. *O. hirci'na*, Scop. (Fig. 1325.) *Lizard Orchis*. Lip three partite, waved at the base, the segments linear, twisted, the lateral ones short, the middle one very long, bifid; sepals ovate, acute, veined, concave, connivent, including the small petals; spur very short, obtuse; ovarium stalked.

English Flora, vol. iv. p. 17.—Hooker, British Flora, ed. 4. vol. i. p. 314.—Lindley, Synopsis, p. 280.—*Satyrium hircinum*, Linn.—English Botany, t. 34.—*Hirnanthoglossum*, Spreng.

Tubers ovate, large. *Stem* erect, from two to three feet high, hollow, leafy. *Leaves* mostly numerous, elliptic lanceolate, the upper ones lanceolate, sessile, a light somewhat glaucous green. *Inflorescence* a terminal erect lax spike, about a foot long. *Bractea* long, linear lanceolate, as long or longer than the flowers. *Flowers* numerous, a dull purple colour, with a strong unpleasant smell. *Sepals* ovate, acute, a greenish purple, striated, and dotted with green, concave, connivent, including the small petals of the same colour. *Lip* a dull purple, pale, and dotted at the base, cut into three segments, curled, and towards the base waved on the margin, the lateral segments short, linear, the middle one very long, narrow, linear, bifid at the end. *Spur* very short, recurved, obtuse, often notched. *Ovarium* twisted, elevated on a footstalk, elliptic, tapering at each end.

Habitat.—Chalk hills and bushy places, in Kent and Surrey.

Perennial; flowering in July.

The flowers of this species are very curiously formed, and in the long many flowered spikes have a very remarkable appearance; but the odour which they exhale is far from being pleasant, and from its being of a similar character to that arising from the goat, it obtained its specific name of *hircina*, or *Goat*. The long middle segment of the lip, and the two lateral short ones, give the flower somewhat the appearance of a Lizard, on which account it has obtained the common name of Lizard Orchis. It is very common in the month of May in





1325

Orchis hircinum.



1326

Orchis ustulata.



1328

Orchis latifolia.



1329

Orchis maculata.



1330

Gymnadenia conopsea.



1331

Habenaria viridis

the shady places and open pastures about Rome, growing sometimes three feet high.

8. *O. ustulata*, Linn. (Fig. 1326) *Dwarf dark-winged Orchis*. Lip three partite, marked with dark raised spots, the lateral segments oblong, linear, the middle one bifid, with oblong lobes; sepals ovate, acute, connivent, including the small petals; spur short, curved; bractees membranous, half as long as the ovarium; leaves oblong lanceolate.

English Botany, t. 18.—English Flora, vol. iv. p. 12.—Hooker, British Flora, ed 4. vol. i. p. 313.—Lindley, Synopsis, p. 260.

Tubers ovate. *Stem* erect, from four to eight inches high, leafy below, naked above. *Leaves* oblong lanceolate, spreading, a somewhat glaucous green. *Inflorescence* an oblong dense terminal spike of numerous crowded small flowers. *Bractea* lanceolate, membranous, single ribbed, about half as long as the ovarium. *Flowers* a dark dingy purple. *Sepals* ovate, acute, concave, connivent, so as to form a small hood including the petals. *Lip* reflexed, three lobed, white, with numerous elevated purple not rough spots, the lateral lobes short, the middle one deeply cleft, mostly with a tooth in the sinus. *Spur* short, obtuse, reflexed, not one-fourth the length of the ovarium.

Habitat.—Dry pastures in various parts of England.

Perennial; flowering in June.

The dingy looking spike of flowers, the pale lip studded with its dark purple smooth spots, connect it with *O. fuscus* in appearance. It often grows only about three inches high, and sometimes the flowers have been found quite white.

** *Tubers* two, undivided. *Bractea* with three or more ribs.

9. *O. laxiflora*, Lam. (Fig. 1327.) *Distant flowered Orchis*. Lip three lobed; lateral lobes rounded and crenated at the end, longer than the truncate, slightly emarginate, intermediate lobe; spur cylindrical, shorter than the ovarium; sepals reflexed upwards, oblong, obtuse; petals connivent; spike elongate, lax; leaves linear lanceolate.

English Botany, Supp. t. 2828.—Babington, British Botany, p. 290.

Tubers two, globose. *Stem* from one to two feet high, round below, somewhat angular and purple above, clothed with long leafy sheaths to near the top. *Leaves* lanceolate, or linear lanceolate, numerously ribbed, a somewhat glaucous green. *Inflorescence* a terminal distant flowered spike. *Bractees* lanceolate, membranous, about the same length as the ovarium, three or many ribbed. *Flowers* purple, or purplish pink. *Sepals* reflexed upwards, oblong, obtuse, often narrower towards the point. *Petals* oblong, connivent over the pistil. *Lip* reflexed, three lobed, the lateral lobes rounded,

crenated on the margin, much longer than the intermediate lobe, which is mostly notched. *Spur* cylindrical, obtuse or emarginate, horizontal or ascending, shorter than the ovary.

Habitat.—Wet meadows and bogs in Jersey and Guernsey.

Perennial ; flowering in May and June.

This beautiful species of *Orchis* is introduced into our Flora from its being a native of Jersey and Guernsey. It is a frequent plant in many parts of the Continent, and very common in Italy. It varies in the colour of its flower from a bright dark purple to a pale pinkish purple, and is mostly yellowish in the throat. The lax spike, reflexed sepals, connivent petals, and narrow lanceolate leaves, readily distinguish it from all the other of our Orchises. Its habit and general appearance is that of *O. Morio*, but from that it is readily distinguished.

*** *Tubers palmated. Bractea with three or many ribs, distinct or netted together.*

10. *O. latifolia*, Linn. (Fig. 1328.) *Marsh Orchis*. Lip indistinctly three lobed, crenated ; sepals reflexed ; petals connivent ; spur conico-cylindrical, shorter than the ovary ; bracteas longer than the flowers, three ribbed, and veinous ; stem fistulous, leafy ; lower leaves ovate oblong, acuminate.

English Botany, t. 2308.—English Flora, vol. iv. p. 21.—Hooker, British Flora, ed. 4. vol. i. p. 314.—Lindley, Synopsis, p. 260.

Tubers more or less distinctly palmated. *Stem* erect, from one to two feet high, hollow, leafy. *Leaves* smooth, dark green, sometimes marked with pale purplish scattered spots, radical ones ovate oblong or oblong lanceolate, acute, erect, those of the stem smaller, lanceolate. *Inflorescence* a terminal dense cylindrical spike of numerous crowded flowers. *Bractea* lanceolate, three ribbed, and veiny, the lower ones much longer than the flowers, the upper scarcely as long. *Flowers* white, pale pink or rose colour, more or less scattered over with darker spots and lines. *Sepals* ovate, acute, reflexed. *Petals* connivent. *Spur* conico-cylindrical, reflexed, shorter than the ovary. *Lip* reflexed, more or less distinctly three lobed, the margin crenated.

Habitat.—Marshes and meadows ; frequent.

Perennial ; flowering in May and June.

This very common but beautiful species varies greatly in the depth of the colour of its flowers ; sometimes they are almost white or pale pink, and they are found from this to deep purple. It is distinguished from the following by its slightly lobed crenated lip, and larger leafy bractea. The leaves are variable in their form, from linear to ovate lanceolate, and the bracteas are longer than the flowers, or as long, rarely shorter ; sometimes in the same spike the lower will be long, and the upper shorter.

11. *O. maculata*, Linn. (Fig. 1229.) *Spotted Palmate Orchis*. Lip plane, three lobed; sepals oblong, spreading; petals connivent; spur cylindrical, rather shorter than the ovary; bractea long as the ovary, three ribbed and veinous; stem solid, leafy; leaves lanceolate, spotted with purple.

English Botany, t. 632.—English Flora, vol. iv. p. 22.—Hooker, British Flora, ed. 4. vol. i. p. 815.—Lindley, Synopsis, p. 260.

Tubers palmated. *Stem* erect, about a foot high, solid, leafy. *Leaves* lanceolate, narrow, gradually diminishing upwards, the lower ones broadly lanceolate, spreading, all marked with irregular purple spots, almost black. *Inflorescence* a terminal dense conico-cylindrical spike of numerous crowded flowers. *Bractea* lanceolate, more or less distinctly three ribbed and veiny, about the length of the ovary, pale green or purplish. *Flowers* pale purple, or white, with various purple streaks and spots. *Sepals* oblong, acute, spreading. *Petals* connivent. *Lip* reflexed, flat, three lobed, the lateral lobes obliquely rounded, crenated, the intermediate one oblong, acute, or angular. *Spur* cylindrical, nearly as long as the ovary.

Habitat.—Meadows, pastures, and woods; common.

Perennial; flowering in June and July.

This is a more frequent plant than the former, of more slender habit, and readily distinguished by its solid leafy stem, the upper leaves diminishing almost into the bractea, its more deeply divided lip and subulate bractea seldom longer than the ovary, and often of a purplish colour. The leaves vary considerably in the number and depth of the colour of the spots upon them, as well as the flowers.

GENUS II. GYMNANDENIA.—BROWN. *Gymnandenia*.

Nat. Ord. ORCHIDÆE. JUSS.

GEN. CHAR. *Pollen masses* naked, approximated, the rest like *Orchis*.
—Name from γυμνο;, *naked*; and αδνη, a *gland*; the essential character of the genus.

1. *G. conopsea*, Br. (Fig. 1330.) *Fragrant Gymnandenia*. Lip of three nearly equal rounded lobes; spur filiform, about twice as long as the ovary; sepals spreading; bractea three ribbed, as long as the ovary; spike elongate, cylindrical; leaves linear lanceolate, keeled; tubers palmate.

Hooker, British Flora, ed. 4. vol. i. p. 815.—Lindley, Synopsis, p. 261.—*Orchis*, Linn.—English Botany, t. 10, (not good).—English Flora, vol. iv. p. 23.

Tubers palmate, with long slender divisions. *Stem* erect, from twelve to eighteen inches high, leafy, hollow. *Leaves* linear lanceolate, a bright green, keeled, and finely striated. *Inflorescence* a

terminal elongated cylindrical spike of numerous rather lax flowers, of an uniform purplish rose colour. *Bractea* lanceolate, membranous, three ribbed, as long as the ovary. *Sepals* oblong, spreading, their margins revolute. *Petals* connivent. *Lip* reflexed, of three nearly equal rounded lobes, of an uniform colour, minutely downy on the surface. *Spur* slender, cylindrical, acute at the point, about twice as long as the ovary, reflexed, and mostly curved upwards. *Pollen masses* naked, crimson.

Habitat.—Dry pastures and heaths in hilly countries, especially in Scotland.

Perennial ; flowering from June to August.

The flowers of this species, though not so beautiful or showy as many of the others, are far more fragrant—perhaps the most fragrant of any of our species.

GENUS III. HABENARIA.—BROWN. *Habenaria*.

Nat. Ord. ORCHIDÆE. JUSS.

GRN. CHAR. *Sepals* and *petals* personate, ringent, arched or helmet-shaped above, *lip* spurred at the base. *Glands* of the stalks of the *pollen masses* naked, distant.—Named from *habena*, a *thong* or *lash* ; so called from the resemblance of some of the species to a thong or lash of a whip.

1. *H. vi'ridis*, Br. (Fig. 1331.) *Green Habenaria*, or *Frog Orchis*. *Lip* linear, the apex three toothed, the middle one smallest ; spur very short, two lobed ; *bractea* three ribbed, lanceolate, longer than the flowers ; spike elongate, cylindrical ; leaves ovate lanceolate ; tubers palmate.

Hooker, British Flora, ed. 4. vol. i. p. 315.—*Peristylus*, Blume.—Lindley, Synopsis, p. 261.—*Satyrion*, Linn.—English Botany, t. 94.—*Orchis*, Swartz.—English Flora, vol. iv. p. 20.—*Gymnadenia*, Richard.

Tubers palmate. *Stem* erect, from four to eight inches high, leafy. *Leaves* dark green, smooth and shining, the lower ones ovate, obtuse, the upper ones lanceolate. *Inflorescence* a terminal oblong cylindrical spike of numerous lax flowers. *Bractea* lanceolate, green, leafy, three ribbed, the lower ones much longer than the flowers, the upper ones about the same length. *Sepals* green, mostly with a pink margin, ovate, concave, converging with the small green petals into a rounded hood. *Lip* reflexed, linear, oblong, three toothed at the end, the middle tooth shorter and smaller than the others, a brownish pink yellowish green in the disk. *Pollen masses* lobate, naked, distant.

Habitat.—Meadows and pastures ; not unfrequent, especially in a sandy or gravelly soil.

Perennial; flowering in June and July.

Readily distinguished by its long bractea, green helmet-shaped flowers, with its dark pink three toothed ligulate lip. The plant is variable in size, according to the soil and situation, sometimes it is not more than two inches high. It is as common on the Continent as with us, but grows usually about a foot high.

2. *H. al'bida*, Br. (Fig. 1332.) *Small White Habenaria*. Lip deeply three lobed, the lateral ones acute, the middle ones larger, oblong, obtuse; spur obtuse, much shorter than the ovary; sepals and petals nearly equal, ovate, concave, connivent; bractea lanceolate, three ribbed, as long as the ovary; leaves oblong, lanceolate; tubers fasciculate.

Hooker, British Flora, ed. 4. vol. i. p. 315.—*Satyrion*, Linn.—English Botany, t. 505.—*Orchis*, Swartz.—English Flora, vol. iv. p. 18.—*Peristylus*, Blume.—Lindley, Synopsis, p. 261.

Tubers numerous, oblong, tapering, united at the base into a cluster. *Stem* erect, slender, from six to about twelve inches high, leafy, hollow. *Leaves* a pale green, somewhat glaucous beneath, the lower ones linear oblong, obtuse, the upper smaller, lanceolate. *Inflorescence* a slender cylindrical spike of numerous small crowded white flowers. *Bractea* ovate lanceolate, about as long as the ovary, green, three ribbed. *Sepals* and *petals* about the same size, ovate, acute, concave, forming a hood. *Lip* reflexed, deeply three lobed, the lateral lobes smaller, more acute than the middle one. *Spur* thick, obtuse, about one-third the length of the ovary.

Habitat.—Mountain pastures; not uncommon.

Perennial; flowering in June and July.

3. *H. bifolia*, Br. (Fig. 1333.) *Butterfly Habenaria*. Lip linear, entire, rather longer than the sepals; spur filiform, half as long again as the ovary; sepals ovate, spreading; petals ovate, connivent; bractea lanceolate, three or five ribbed, shorter than the ovary; pollen masses with parallel cells; radical leaves erect, oblong, much tapered at the base.

Hooker, British Flora, ed. 4. vol. i. p. 315.—*Orchis bifolia*, Linn.—*Platanthera*, Richard.—Lindley, Synopsis, p. 261.

β. brachyglossa, Lind. "Anther emarginate, lip somewhat shorter, leaves obtuse, very much tapering to the base."

Lindley, Synopsis, p. 330.—"*Platanthera brachyglossa*," Reich.

Tubers tapering. *Stem* erect, about a foot high, somewhat angular, striated, bearing one or several small lanceolate leaves above, and at the base two, oblong, obtuse, much tapered at the base into a foot-stalk, sometimes there is a third, a smooth shining green, numerous striated, erect, or nearly so. *Inflorescence* a terminal spike of numerous lax white flowers. *Bractea* green, lanceolate, three or five ribbed, shorter, or about as long as the ovary. *Sepals* ovate,

spreading, petals ovate, concave, connivent. *Lip* linear, obtuse, entire, about as long as the sepals. *Spur* slender, filiform, slightly swollen towards the end, the apex pointed, or it is perfectly cylindrical, and about half as long again as the ovarium. *Pollen masses* with cells parallel to each other, entire or notched at the end.

Habitat.—Groves and thickets; not unfrequent, and mostly growing with the following.

Perennial; flowering in June.

The flowers of this species are smaller, and less numerous than the following, the leaves smaller, more erect, and more tapering at the base; the lip is ligulate, and the cells of the anthers parallel.

4 *H. chlorantha*, Custor. (Fig 1334.) *Yellowish Green Butterfly Habenaria*. Lip ovate lanceolate, greenish; spur cylindrical, club-shaped, twice as long as the ovarium; sepals ovate oblong, acute, spreading, rather larger than the connivent petals; bractea ovate lanceolate, as long as the ovarium, three ribbed, and netted; pollen masses with divaricating cells; radical leaves spreading, obovate.

Platanthera.—Lindley, Synopsis, p. 330.—*Orehis bifolia*.—English Flora, vol. iv. p. 9.—English Botany, t. 22.—*Habenaria bifolia*.—Hooker, British Flora, ed. 4. vol. iv. p. 315. var. β .

In general appearance this is similar to the last species, but the leaves are larger, broader, spreading, and very much less tapering at the base, the flowers are larger, a greener colour, the spur thicker, and more club-shaped, the lip ovate lanceolate, and the whole plant is larger and stouter. These, together with the broader diverging anthers, are the characters which distinguish it from *H. bifolia*.

Habitat.—Groves and thickets; not unfrequent.

Perennial; flowering in June.

GENUS IV. A'CERAS.—BROWN. *Man Orchis*.

Nat. Ord. ORCHID'ÆE. JUSS.

GEN. CHAR. *Sepals* and *petals* herbaceous, personate, ringent, helmet-shaped above, *lip* three-partite, without a spur at the base. *Glands* of the stalks of the *pollen masses* enclosed in a common pouch.—Name α ., *without*; and $\kappa\epsilon\acute{\alpha}\varsigma$, a *horn*; so named in allusion to the lip being without a spur.

1. *A. anthropophora*, Br. (Fig. 1235.) *Green Man Orchis*. Lip longer than the ovarium, three-cleft, linear, the middle lobe bifid.

English Flora, vol. iv. p. 25.—Hooker, British Flora, ed. 4. vol. i. p. 316.—Lindley, Synopsis, p. 262.—*Ophrys*, Linn.—English Botany, t. 29.

Tubers ovate, and as well as the radicles clothed with woolliness. *Stem* erect, about a foot high, a smooth bright shining green, clothed



1332

Habenaria albida.



1333

Habenaria bifolia.

1335

Asceris anthrophthora.



1336

Herminium monorchis.

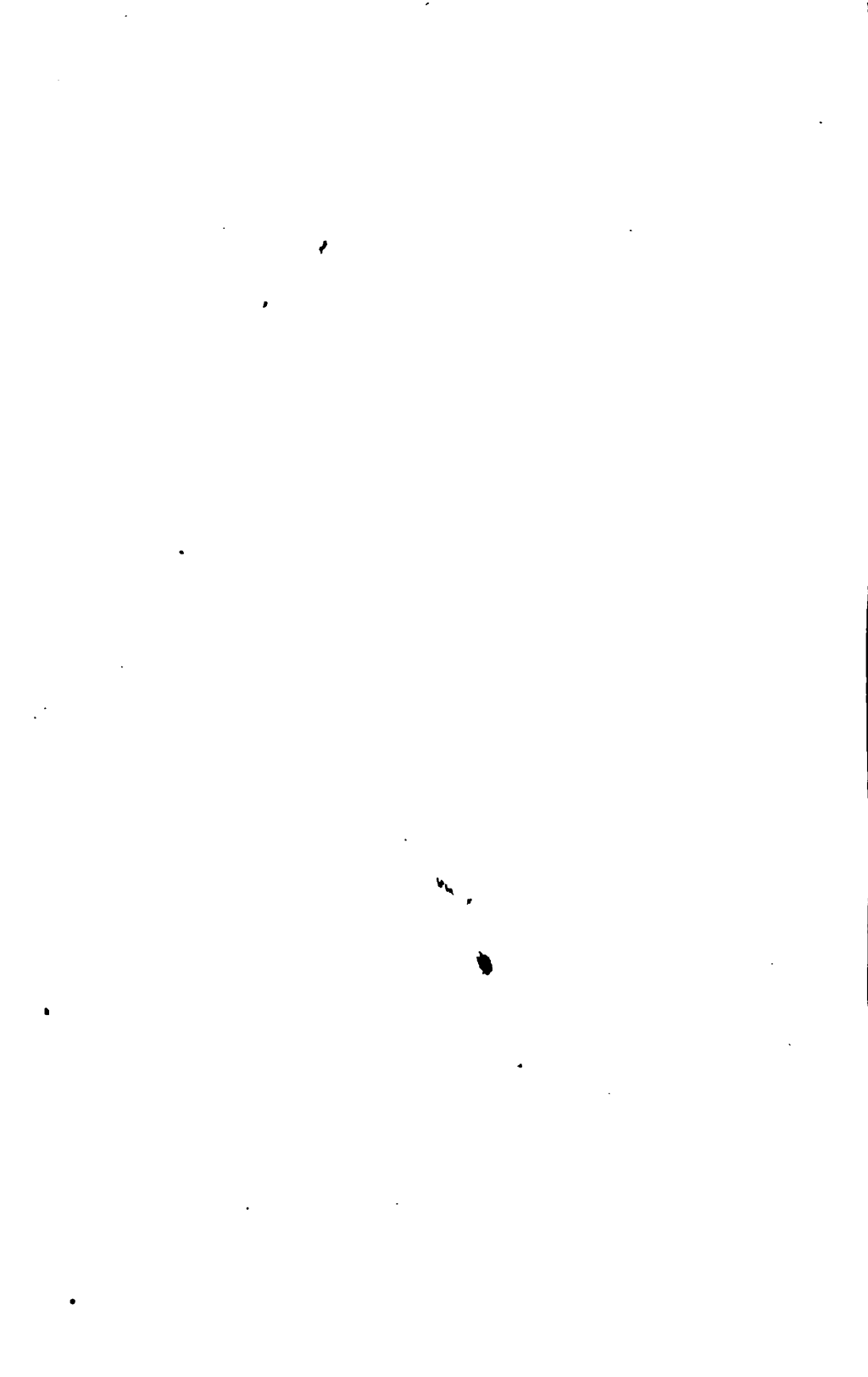
1337

Ophrys apifera.



1338

Ophrys arachnites.



with leafy sheaths above. *Leaves* oblong lanceolate, or elliptic oblong, numerous ribbed. *Inflorescence* a long terminal cylindrical spike of numerous yellowish green flowers. *Bractea* lanceolate, taper pointed, thin, membranous, about as long as the ovary. *Sepals* green, ovate lanceolate, concave, connivent, three ribbed, forming a helmet-shaped hood, including the two small linear lanceolate green *petals*. *Lip* reflexed, a pale yellowish green, deeply cut into three narrow linear segments, the middle lobe deeply cut into two other linear segments. *Spur* wanting. *Pollen masses* included in a common pouch.

Habitat.—Clay or chalky pastures; in Surrey, Kent, Norfolk, and Suffolk.

Perennial; flowering in June.

The common colour of the flower is an entire pale green, with the lip a paler colour, but it is not uncommon on the Continent to find them with the edges of the sepals and lip of a pink or brownish tinge. Hooker mentions that "*Mr. Wilson* has observed a monstrous state with the petals partly changed into anthers, one edge becoming pouched, sometimes both containing masses of pollen."

GENUS V. HERMINIUM.—BROWN. *Musk-Orchis*.

Nat. Ord. ORCHIDÆE. JUSS.

GEN. CHAR *Sepals* and *petals* herbaceous, spreading, *lip* short, lobed, not spurred, but saccate at the base. *Glands* of the stalks of the *pollen masses* naked, distinct.—"Name probably derived from *ἑμιν, ἑμινος, fulcrum tori*; in allusion either to the thick, though short, column of the flower, or to the stem or scape of the flowers."—Hooker.

1. *H. monor'chis*, Brown. (Fig. 1336.) *Green Musk Orchis*. Petals small, sub-hastate; lip rather longer, three lobed; leaves two, lanceolate, radical.

English Flora, vol. iv. p. 27.—Hooker, British Flora, ed. 4. vol. i. p. 316.—Lindley, Synopsis, p. 262.—*Ophrys*, Linn.—English Botany, t. 71.

Tubers two, of very unequal sizes, and as well as the thick fibres clothed with wooliness. *Stem* erect, smooth, from four to six inches high, slender. *Leaves* two, oblong lanceolate, radical, sometimes there is a third upon the stem, but much smaller, a smooth bright green, obscurely ribbed. *Inflorescence* a terminal cylindrical spike of small green flowers, having a strong smell of musk. *Bractea* small, lanceolate. *Sepals* three equal ovate concave spreading pieces, rather shorter than the *petals*, which are green, somewhat fleshy, ovate, hastate, *lip* reflexed, three lobed, the lateral lobes short, obtuse, the

middle one much longer, tumid, but not spurred at the base. *Glands* of the stalks of the pollen masses naked, separate, distinct. *Pollen masses* sub-globose, on short stalks.

Habitat.—Chalky pastures, chiefly in the South and South-East of England.

Perennial; flowering in June and July.

GENUS VI. O'PHRYS—LINN. *Ophrys*, or *Insect Orchis*.

Nat. Ord. ORCHID'ÆÆ. JUSS.

GEN. CHAR. *Sepals* spreading, coloured, or herbaceous. *Petals* much smaller than the sepals, and mostly coloured, *lip* without a spur, convex, more or less lobed. *Glands* of the stalks of the *pollen masses* in separate pouches, each mass deeply divided into numerous angular lobes.—Name *ὄφρυς*, the *eye-brow*; this plant, according to Pliny having been used to blacken the eye-brows.

1. *O. apifera*, Huds (Fig. 1337.) *Bee Orchis*. Lip roundish ovate-tumid, convex, velvety, variegated, five lobed, the two posterior lobes gibbous, ovate, the three anterior, recurved, the intermediate one trifid, terminating in a smooth awl-shaped point, inflexed; petals short, hairy; cells of the pollen mass elongated into a hooked point.

English Botany, t. 383.—English Flora, vol. iv. p. 30.—Hooker, British Flora, ed. 4. vol. i. p. 316.—Lindley, Synopsis, p. 262.

Tubers globose. *Stem* erect, about a foot high, a smooth somewhat glaucous green. *Leaves* elliptic lanceolate, keeled, numerous ribbed, those of the stem with a tapering point. *Inflorescence* a terminal lax spike of few flowers. *Bractea* large, lanceolate, herbaceous. *Sepals* a pale purplish green or white, oblong, spreading, concave, three ribbed, the keel green. *Petals* small, oblong, green, hairy on the inner surface, spreading. *Lip* large, tumid, ovate, as long or longer than the sepals, clothed externally with dark rich glossy brown velvety pubescence, variegated with a yellow disk, and angular, or curved lines and spots, the margin five lobed, the two on each side at the base ovate, and mostly swollen into a conical or gibbous protuberance, velvety, the three others recurved, the lateral ones large, the margin waved unequally, the intermediate one small, smooth, somewhat glandular, three lobed, the terminal one small, awl-shaped. *Pouches* of the pollen masses terminated in an incurved point. *Pollen masses* sub-globose, on long stalks. *Ovary* oblong, ribbed, on a short footstalk.

Habitat.—Meadows and pastures in chalky or limestone countries in various parts of England, but rare.

Perennial; flowering in July.

This, the largest and most beautiful of our insect Orchises, is ex-

treinely handsome, and as its name implies, much resembles a bee in its appearance. The lip varies considerably in its markings, sometimes it is without any yellow lines, at others it has the yellow lines without spots, and occasionally it has the spots without the lines. The disk is smooth and polished, and varies greatly in being larger or smaller, otherwise it is constant in its characters, and readily distinguished from all the other species.

2. *O. arachnites*, Willd. (Fig. 1338.) *Late Spider Orchis*. Lip roundish, or broadly ovate, tumid; convex velvety, variegated, with five shallow inflexed marginal lobes, the terminal one at the apex flat, three lobed, smooth, curved outwards; petals short, hairy; cells of the pollen masses rather short, obtuse.

English Botany, Supp. t. 2596.—English Flora, vol. iv. p. 31.—Hooker, British Flora, ed. 4. vol. i. p. 317.—Lindley, Synopsis, p. 262.

Tubers globose. *Stem* erect, about a foot high, a smooth somewhat glaucous green. *Leaves* elliptic, or ovate lanceolate, numerous ribbed, those on the stem narrower, and more tapering at the point. *Inflorescence* lax spike of few flowers. *Bractea* large, herbaceous, lanceolate. *Sepals* a pale purplish pink, with three green veins, concave, ovate lanceolate, spreading. *Petals* small, sub-ovate, smooth externally, hairy on the inside, the margins recurved. *Lip* roundish, or broadly ovate, tumid, longer than the sepals, clothed with a velvety pubescence, of a fine dark purplish brown, marked with two smooth yellow lines, round, a reddish brown oblong disk, and between the lines it is of a purplish colour, sometimes there are spots also, but the markings are different in almost every flower. The margin of the lip is divided into five lobes, somewhat reflexed, the two on each side at the base ovate, and mostly swollen into a more or less conical or tumid protuberance, the two others on the sides very shallow, and scarcely reflexed, the terminal one at the apex smooth, three lobed, or somewhat heart-shaped, protruding, curved forwards. *Pouches* of the pollen masses short, terminating in an obtuse point. *Pollen masses* on long slender stalks. *Ovarium* oblong, strongly ribbed, on a short stalk.

Habitat.—Chalky downs of South Kent, between Folkstone and Sittingbourne.

Perennial; flowering in July.

This species, though with the general characters of *O. apifera*, is, when they are seen growing together, readily distinguished from it. The sepals are smaller, and the petals small, mostly of a brownish colour, somewhat deltoid in form, from the margin being recurved. The lip, though tumid, has its lobes bent back, not recurved, but curved forwards. It is frequent about Rome, Naples, and other parts of Italy, and is not uncommon in various parts of the Continent, Sicily and Malta.

8. *O. arinifera*, Huds. (Fig. 1339.) *Earley Spider Orchis*. Lip oblong, ovate, convex, tumid, velvety, variegated, the margin reflexed, three lobed, the middle lobe largest, emarginate; sepals as long as the lip; petals linear, smooth; cells of the pollen masses with a short obtuse incurved point.

English Botany, t. 65.—English Flora, vol. iv. p. 32.—Hooker, British Flora, ed. 4. vol. i. p. 317.—Lindley, Synopsis, p. 262.

β. fucifera, (Fig. 1340.) Lip entire, with a spreading wavy margin.

O. aranifera, var. *β.*—Hooker, British Flora, ed. 4. vol. i. p. 317.—*O. fucifera*, Smith.—English Botany, Supp. t. 2649.—English Flora, vol. iv. p. 33.—Lindley, Synopsis, p. 262.

Tubers globose, woolly. *Stem* erect, about a foot high, slender, of a somewhat glaucous green. *Leaves* oblong lanceolate, the two or three upper ones on the stem smaller, and more pointed. *Inflorescence* a terminal lax spike of from four to six flowers. *Bractea* large, leafy, lanceolate, many ribbed. *Sepals* oblong, three ribbed, pale green. *Petals* linear, smooth, a paler green, and rather shorter than the sepals. *Lip* oblong, ovate, convex, and somewhat tumid, the margin somewhat reflexed, and more or less distinctly three lobed, the middle one notched, and without any terminal point or gland in the axis, the surface is a fine velvety glossy brown, with a smooth disk; and two lateral lines, connected with a cross bar, but these markings are very irregular, seldom the same on two plants, and sometimes they are found without any, the lip is about as long or shorter than the sepals. *Pouches* of the pollen masses terminating in a short curved point. *Pollen masses* on long stalks.

Habitat.—Chalky and clayey pastures; not common. *β.* hills and banks in Kent.

Perennial; flowering in April and May.

This and its variety are very common plants about Rome, Pisa, and other parts of Italy. Its smooth linear petals, and the absence of a terminal lobe to the lip, readily distinguish it; but the lip varies greatly in being broader or narrower, more or less tumid, and in being distinctly lobed, or only waved on the margin. Its colour is a uniform brown, but the lateral lines and cross bar are often absent, and sometimes there is scarcely space between the bars.

The flower delineated on the left side of our page is an intermediate variety, approaching *β. fucifera*, in having its lip nearly entire on the margin, and its bars smaller. It is, however, here drawn to exhibit a remarkable deviation from the usual arrangement of the flower, in having the two pollen masses fixed in an opening upon the side of the lip instead of in the usual place above the stigma. They were fully developed, and contained pollen apparently in a perfect state; but how far the ovules would have attained perfection with the stamen in this situation, we are unable to say, as the plant was



1339

Ophrys aranifera. *



1341

Ophrys muscifera.



1342

Goodyera repens.



1340

1340



1344

Spiranthes autumnalis.



1345

Spiranthes aestivalis.

* For No. 1340, see Plate 183.

gathered with several others, and this *lucis natura* was not discovered until examination some time after.

4. *O. muscifera*, Huds. (Fig. 1341.) *Fly Orchis*. Lip oblong, velvety, with a square smooth spot in the middle, three lobed, the lateral lobes lanceolate, the middle one much the longest, and deeply cleft; petals filiform; cells of the pollen masses short, obtuse.

English Botany, t. 64.—English Flora, vol. iv. p. 29.—Hooker, British Flora, ed. 4. vol. i. p. 317.—Lindley, Synopsis, p. 262.

Tubers globose. *Stem* erect, about a foot high. *Leaves* oblong lanceolate, a somewhat glaucous green, those of the stem narrower. *Inflorescence* a lax terminal spike of from four to eight distant flowers. *Bractea* linear lanceolate, as long or longer than the ovary. *Sepals* oblong, ovate, green, smooth, spreading. *Petals* two, ascending, filiform, the margins revolute, downy. *Lip* reflexed, longer than the sepals, oblong, velvety, of a deep chocolate colour, with a smooth shining square pale blueish spot on the disk, and at the base two dark brown spots, the margin is three lobed, the lateral lobes are lanceolate or oblong, the middle one is much the longest, more or less deeply cleft into two broad lobes, concave, and pale smooth shining green beneath. *Pouches* of the pollen masses short, obtuse. *Pollen masses* yellow, on slender stalks.

Habitat.—Chalk, limestone, and clayey pastures, and shady places in various parts of England; sometimes very abundant.

Perennial; flowering in June.

GENUS VII. GOOD'YERA.—BROWN. *Goodyera*.

Nat. Ord. ORCHID'ÆE. JUSS.

GEN. CHAR. *Sepals* ovate, spreading. *Petals* erect, *lip* entire, remarkably concave beneath, inclosed by the lateral sepals. *Column* tapered, distinct, with two teeth at the apex. *Stigma* in front oblique. *Anthers* two celled. *Pollen masses* sessile.—Name in compliment to Mr. John Goodyer, a Hampshire Botanist of the time of Gerarde.

1. *G. repens*, Br. (Fig. 1342.) *Creeping Goodyera*. Root creeping; lower leaves ovate, petiolate, netted with veins; upper part of the stem and flowers downy, sepals, petals, and lip ovate lanceolate.

English Flora, vol. iv. p. 34.—Hooker, British Flora, ed. 4 vol. i. p. 317.—Lindley, Synopsis, p. 257.—*Satyrion*, Linn.—English Botany, t. 289.

Root creeping, with long knotty jointed downy branches. *Stem* erect, about a foot high, round, smooth, leafy below and above, bearing several lanceolate *bractea*. *Leaves* tufted, from six to eight, ovate, obtuse, smooth, five ribbed, with numerous connecting veins,

giving it a netted appearance, often scattered over with brown spots. *Inflorescence* a terminal spiral unilateral spike of from ten to twenty small white downy *flowers*, very fragrant. *Bractea* lanceolate, downy, as long as the ovary. *Sepals* ovate oblong, white, downy externally. *Petals* lanceolate, erect, converging, about as long as the sepals. *Lip* entire, ovate, concave, tumid beneath in a remarkable manner, above and fixed to the lower swollen part is an oblong acute pointed piece. *Column* short, thick, tapering into two points at the apex. *Stigma* in front oblique. *Pouches* of the pollen masses parallel, short, obtuse. *Pollen masses* oblong, sessile, granulated.

Habitat.—Old fir forests in the North of England, and especially in North Highlands of Scotland.

Perennial; flowering in August.

GENUS VIII. NEOTTIA.—LINN. *Bird's-nest Orchis*.

Nat. Ord. ORCHIDÆE. JUSS.

GEN. CHAR. *Sepals* and *petals* brown, sub-campanulate, lip not spurred, dependent, two lobed, concave at the base. *Column* taper, erect, four times as long as the stigma. *Stigma* two lipped. *Anther* naked, terminal, free, attached to the back of the stigma.—Name from *neottia*, a *Bird's nest*.

1. *N. Nidus avis*, Rich. (Fig. 1343.) *Bird's nest Orchis*. Stem erect, with several sheathing scales; lip linear, oblong, with two spreading lobes.

Lindley, Synopsis, p. 258.—*Ophrys*.—English Botany, t. 48.—*Listera*.—English Flora, vol. iv. p. 39.—Hooker, British Flora, ed. 4. vol. i. p. 318.

Root numerous, crowded, whitish fleshy cylindrical tubers, the whole plant of a pale brown hue, destitute of green. *Stem* erect, from one to two feet high, angular, striated, hollow, without leaves, but scattered over with lanceolate sheathing bractea. *Inflorescence* a terminal spike of numerous crowded flowers. *Bractea* small, lanceolate, membranous. *Sepals* and *petals* of about the same length and colour, ovate, concave, sub-campanulate. *Lip* reflexed, linear, oblong, with two spreading linear obtuse lobes, concave at the base. *Column* cylindrical, erect, tapering, about four times as long as the stigma, the *anthers* naked, free at the summit, attached at the back of the upper lip of the stigma. *Stigma* two lipped, the upper one short, and rounded, the lower one longer, and pointed. *Capsules* ovate, three ribbed, elevated on a pedicel nearly as long as itself, and crowned by the persistent column.

Habitat.—Shady woods amongst decayed roots and leaves in various parts of England and Scotland.

Perennial; flowering in May and June.

This remarkable species of Orchis has much the general aspect of the Orobanche, and like the *Limodorum abortivum*, grows in the shade of woods amongst decayed roots and leaves. This species is not unfrequent in the mountainous districts of the Continent, and is destitute of leaves, but of greenish violet colour.

GENUS IX. SPIRANTHES.—RICH. *Lady's Tresses*.

Nat. Ord. ORCHIDÆÆ. JUSS.

GEN. CHAR. *Sepals* and *petals* coloured, converging parallel with the lip. *Lip* included within the lateral segments, entire, unguiculate, with two fleshy projections at the base. *Column* taper, club-shaped, free, with two teeth at the apex. *Stigma* prominent, rostrate.—Name from *σπῆρα*, *spiral*; *ἄθος*, *flower*; in allusion to the spiral form of the inflorescence.

1. *S. autumnalis*, Richard. (Fig. 1344.) *Autumnal Lady's Tresses*. Stem leafless, sheathed; radical leaves ovate, or ovate oblong, contracted into a footstalk; spike spirally twisted; lip obovate, emarginate.

Lindley, Synopsis, p. 257.—*Ophrys spiralis*, Linn.—English Botany, t. 541.—*Neottia spiralis*, Sw.—English Flora, vol. iv. p. 36.—Hooker, British Flora, ed. 4. vol. i. p. 318.

Tubers two or three, large, ovate, oblong, downy. *Stem* erect, radical, from four to eight inches high, sheathed, with membranous taper pointed *bractea*. *Leaves* radical, tufted, ovate, or ovate oblong, contracted at the base into a footstalk, mid-rib stout, and the lateral veins several, parallel, netted. *Inflorescence* a terminal spiral spike of numerous small flowers, all turned to one side, highly fragrant, and in a single row, downy, as well as the upper part of the stem. *Bractea* ovate, with a long taper point. *Sepals* pale, greenish white, ovate lanceolate, one above, and two meeting under the lip. *Petals* oblong, parallel with the lip, and converging with the upper sepal. *Lip* obovate, scarcely longer than the sepals, with a short claw, and having at the base two fleshy projections. *Column* tapering to the base, globose at the top, with two tapering teeth at the apex. *Stigma* prominent, rostrate. *Anthers* parallel with the stigma. *Capsule* ovate, tumid, three ribbed, on a short footstalk.

Habitat.—Dry open hilly pastures in various parts of England, especially in a chalky or sandy soil.

Perennial; flowering in August and September.

2. *S. æstivalis*, Rich. (Fig. 1345.) *Summer Lady's Tresses*. Stem leafy; leaves linear, or oblong lanceolate; spike spirally twisted; lip oblong, ovate, entire.

Babington in Hooker British Flora, ed. 4. vol. i. p. 318.

This is distinguished from the last species by the stem bearing several linear lanceolate leaves, and the radical leaves are lanceolate, or oblong lanceolate. In other respects they are the same, except that the lip in *S. æstivalis* is always entire, while in *S. autumnalis* it is often notched.

Habitat.—"Marshy land by St. Owen's Pond, Jersey." "Bog between Lyndhurst and Christchurch, in the New Forest."—*Babington*.

Perennial; flowering in July and August.

Native specimens of this plant we have not seen. It is not unfrequent in various parts of the Continent.

3. *S. gemmip'ara*, *Lind.* *Proliferous Lady's Tresses*. "Leaves lanceolate, as tall as the stalk; spike three ranked, twisted; bractea smooth."—*Smith*.

English Flora, vol. iv. p. 37.—English Botany, Supp. t. 2786—"bad."—Hooker, British Flora, ed. 4. vol. i. p. 318.—*Neottia*.—Lindley, Synopsis, p. 257.

Habitat.—Dunbog, Bear Haven, Ireland.—*Mr. J. Drummond*.

Perennial; flowering in July.

"Nothing satisfactory is known of this." Since this remark of Hooker's was made, the plant has again been found in Ireland; but we have not seen it, or any good drawing of the plant.

GENUS X. LISTE'RA.—BROWN. *Twayblade*.

Nat. Ord. ORCHID'ÆÆ. JUSS.

GEN. CHAR. *Sepals* and *petals* herbaceous, connivent. *Lip* two lobed, dependent, not spurred. *Column* taper, erect, much shorter than the stigma. *Stigma* plane, ovate. *Anthers* covered by the hood, proceeding from the back of the column. *Pollen* farinaceous.—Named in honour of *Dr. Martin Lister*, an eminent British naturalist.

1. *L. ova'ta*, *Br.* (Fig. 1246.) *Common Twayblade*. Stem with two opposite ovate elliptical leaves; lip deeply cut into two linear lobes.

English Flora, vol. iv. p. 38.—Hooker, British Flora, ed. 4. vol. i. p. 318.—Lindley, Synopsis p. 258.—*Ophrys*, Linn.—English Botany, t. 1548.

Root of numerous long branched fibres. *Stem* erect, from one to two feet high, slender, simple, downy above, clothed at the root with membranous sheaths, and bearing about one-third up a pair of opposite ovate or elliptic ovate leaves, each with several parallel ribs. *Inflorescence* a long slender terminal spike of numerous pale green



1346

Listera ovata.



1347

Listera cordata.



1348

Epipactis latifolia.



1349

Epipactis purpurea.



1350

Epipactis rubra.



1351

Epipactis palustris.

flowers. *Bractees* ovate, taper pointed, thin, smooth. *Flowers* elevated on a footstalk, as long or longer than the bractea. *Sepals* ovate, concave, connivent, often tinged of a brownish colour. *Petals* smaller, included in the sepals. *Lip* dependent, much longer than the sepals, smooth, pale yellowish green, deeply cut into two linear lobes, entire at the base, and in the disk is a glandular furrow. *Column* two lipped, the upper lip crested, and covering the anthers. *Capsules* roundish, ovate, ribbed.

Habitat.—Woods and moist pastures; frequent.

Perennial; flowering in June.

2. *L. cordata*, Br. (Fig. 1347.) *Heart-leaved Twayblade*. Stem with two opposite cordate leaves; lip with two awl-shaped lobes, and toothed at the base on each side.

English Flora, vol. iv. p. 39.—Hooker, British Flora, ed. 4. vol. i. p. 818.—Lindley, Synopsis, p. 258.—*Ophrys*, Linn.—English Botany, t. 358.

Root long simple fibres. *Stem* erect, about four inches high, slender, delicate, smooth, erect, enveloped at the base with membranous sheaths, and bearing a little below the middle a pair of opposite smooth heart-shaped leaves, of a pale green, three ribbed. *Inflorescence* a terminal lax spike of few pale yellowish green small flowers, sometimes tinged with brown. *Sepals* and *petals* linear oblong, somewhat connivent. *Lip* reflexed, cut into two slender awl-shaped spreading lobes, and toothed on each side at the base. *Column* without a crest behind the anther. *Capsule* globose, ribbed, elevated on a short stalk.

Habitat.—Boggy places in mountainous districts in the North of England, Scotland, and Ireland.

Perennial; flowering in July.

GENUS XI. EPIFAC'TIS.—BROWN. *Helleborine*.

Nat. Ord. ORCHID'Æ. JUSS.

GEN. CHAR. *Sepals* and *petals* spreading, or converging, more or less coloured, *lip* embracing the column, inflated at the base, entire, or three lobed, the middle lobe large, and jointed to the others. *Column* plane, convex, with two teeth at the apex. *Pollen masses* acuminate. *Anthers* two celled.—Name given to some kind of Hellebore by the Greeks.

1. *E. latifolia*, Swartz. (Fig. 1348.) *Broad-leaved Helleborine*. Leaves broadly ovate, amplexicaul; bractea lanceolate, the lower ones much longer than the drooping flowers; lip roundish, acuminate at the point, shorter than the perianth; ovarium downy.

English Flora, vol. i. p. 41.—Hooker, British Flora, ed. 4. vol. i. p. 319.—Lindley, Synopsis, p. 258—*Serapias*, Linn.—English Botany, t. 209.

Root with creeping stems and downy radicles. *Stems* solitary, or several, from one to two feet high, round, smooth, leafy, enveloped at the base in thin membranous sheaths. *Leaves* a smooth bright shining green, of a thin texture, very numerous ribbed with fine parallel veins, the lower ones broadly ovate, acute, embracing the stem at the base, the upper ones lanceolate, sessile. *Inflorescence* a long terminal lax spike of numerous alternate drooping flowers. *Bracteas* lanceolate, leafy, the lower ones much longer than the flowers, the upper ones as long. *Flowers* a greenish white, often tinged with pink or purple, each elevated on a footstalk, as long or shorter than the downy ovary. *Sepals* and *petals* nearly equal in size, ovate, acuminate, more or less connivent. *Lip* shorter than the petals, three lobed, the terminal one somewhat heart-shaped, rounded, with a short acute point, entire, or somewhat waved on the margin, the disk tumid, surrounded with a dull red line. *Stigma* large, angular, prominent. *Cells* of the pollen masses elliptic oblong.

Habitat.—Woods, especially in mountainous districts; not unfrequent.

Perennial; flowering in July and August.

This is by no means an uncommon plant in shady situations, seeming to prefer a limestone district. It is as frequent on the Continent as with us. A variety, the *E. media*, Fries. is occasionally found, having the leaves all lanceolate, and narrower, except the lowest, and the flower having the terminal division of the lip triangular, cordate, acute, and as long as the lanceolate sepals and petals.

2. *E. purpurata*, Smith. (Fig. 1349.) *Purple-leaved Helleborine*. "Leaves ovate lanceolate; bracteas linear, all twice as long as the flowers; lip shorter than the calyx (sepals), entire; germen downy."—Smith.

English Botany, Supp. t. 2775.—English Flora, vol. iv. p. 42.—Hooker, British Flora, ed. 4. vol. i. p. 319.—Lindley, Synopsis, p. 259.

"Root more fleshy, thicker, and growing much deeper in the ground than any other species of this genus that we are acquainted with. *Stem* from one to two feet high, round, and pubescent. Lower *leaves* ovate, lanceolate, sheathing at the base, upper sessile, linear lanceolate, from two to three inches long, the veins and margins covered with a slight rough pubescence. The leaves are considerably smaller, and of a more delicate texture than in any of the varieties of *O. latifolia*. *Spike* four to six inches in length, drooping before the flowers expand, but afterwards assuming an erect position. *Bracteas* linear, acute, horizontal with the spike, the lower about twice the





1352

Epipactis grandiflora.



1353

Epipactis ensifolia.

1364

Corallorhiza innata.



1365

Melastictis paludosa.



1366

Liparis loeselii.



1367

Orobis laxiflora.



length of the flowers, the upper shorter. The bracteas are described by Sir J. E. Smith as being all longer than the flowers, which they appear to be previous to the expansion of the blossoms, the period of growth when Sir James's description was taken. The upper are, however, when at maturity, shorter than the flowers. *Perianth* (sepals) spreading, extending beyond the petals. *Flowers* of a yellow green colour, tinged with pink."—*J. Forbes*, Eng. Bot. Supp.

Habitat.—Wood near the Noris farm, at Leigh, Worcestershire, in 1807.—*Rev. Dr. Abbot*. Woods at Woburn Abbey.—*Mr. J. Forbes*.

Perennial; flowering in July and August.

This is a very doubtful species, and we fear scarcely more than a variety of *E. latifolia*, which species varies in the colour of its flowers, according as it is more or less exposed to the light, and the nature of the soil in which it has grown. We have specimens collected near Sheffield, Yorkshire, which do not differ from the above description, but which we have not considered otherwise than a variety of *E. latifolia*.

3. *E. palustris*, Swartz. (Fig. 1851.) *Marsh Helleborine*. Leaves lanceolate, amplexicaul; bracteas mostly shorter than the flowers; sepals spreading; lip three lobed, longer than the sepals; middle lobe ovate, crenate.

English Flora, vol. iv. p. 43.—Hooker, British Flora, ed. 4. vol. i. p. 319.—Lindley, Synopsis, p. 259.—*Serapias*, Scop.—English Botany, t. 270.—*S. longifolia*, Linn.

Root creeping, with long simple fibres. *Stem* erect, from twelve to eighteen inches high, slightly pubescent, enveloped in a membranous sheath at the base. *Leaves* bright green, the lowest ovate lanceolate, the uppermost linear, numerous ribbed, with slender parallel veins. *Inflorescence* a terminal spike of a few lax flowers, large and handsome, at first erect, afterwards slightly drooping. *Bracteas* lanceolate, leafy, as long or mostly shorter than the flowers. *Flowers* white, striped with crimson. *Sepals* ovate, acute, spreading. *Petals* about the same length. *Lip* three lobed, longer than the petals, the terminal lobe large, sub-rotundate, obtuse or heart-shaped, concave, the margin strongly crenated with unequal teeth, and on the disk is an elevated notched crescent formed appendage. *Ovary* pubescent, strongly ribbed, elevated on a short stalk.

Habitat.—Moist and marshy places in a chalky or gravelly district, but not common.

Perennial; flowering in July and August.

4. *E. grandiflora*, Smith. (Fig. 1852.) *Large White Helleborine*. Leaves ovate lanceolate, acuminate, sessile; bracteas much longer than the erect flowers; ovary smooth; sepals ovate, spreading; lip three lobed, shorter than the sepals, the middle lobe cordato-ovate.

English Flora, vol. iv. p. 44.—Hooker, British Flora, ed. 4. vol. i.

p. 319.—Lindley, Synopsis, p. 259.—*Serapias*, Linn.—English Botany, t. 271.—*Cephal-anthera pallens*, Richard.—*Epipactus pallens*, Swartz.

Root creeping, with simple long fibres. *Stem* erect, about a foot high, round, smooth, leafy. *Leaves* ovate, or elliptic lanceolate, with a tapering point, sessile, and somewhat clasping the stem at the base, a smooth fine green, many ribbed, gradually becoming smaller above, and forming at length into *bractea*, which are longer than the flowers, except the uppermost ones. *Inflorescence* a terminal spike of few distant white erect or slightly drooping flowers. *Sepals* ovate, acute, spreading, white or pale green externally. *Petals* similar to the sepals, but pure white, becoming brown after blooming. *Lip* three lobed, the middle lobe broader than long, ovate or heart-shaped, marked with three yellow lines. *Column* very long. *Capsule* narrow, long, sessile.

Habitat.—Woods and shady places, especially in a chalky or limestone country; not very common.

Perennial; flowering in June.

5 *E. ensifolia*, Swartz. (Fig. 1353.) *Narrow-leaved White Helleborine*. Leaves lanceolate, the upper ones linear, acuminate, amplexicaul; bractees very small; ovarium smooth; sepals lanceolate, slightly spreading, inclosing the three lobed lip, the middle lobe obtuse.

English Flora, vol. iv. p. 45.—Hooker, British Flora, ed. 4. vol. i. p. 319.—Lindley, Synopsis, p. 259.—*Serapias*, Linn.—English Botany, t. 494.—*Cephal-anthera ensifolia*, Richard.

Root scarcely creeping, of numerous simple downy fibres. *Stem* about a foot high, erect, smooth, slender, enveloped at the base in membranous sheaths, and bearing numerous alternate leaves. *Leaves* smooth, bright green, many ribbed, embracing the stem at the base, the lowest one often ovate, the rest lanceolate, gradually diminishing upwards into linear acuminate. *Inflorescence* a terminal spike of a few somewhat spreading flowers, of a pure white. *Bractees* very small, awl-shaped, smooth, as well as the slender *ovarium*. *Sepals* lanceolate, or ovate lanceolate, acuminate, scarcely spreading, smooth. *Petals* similar to the sepals, and enclosing the *lip*, which is short, three lobed, the terminal lobe very obtuse, broader than long, yellowish on the disk, with several elevated lines. *Column* very long. *Stigma* large, angular, peltate. *Pollen masses* deeply cloven. *Capsule* linear, strongly ribbed, sessile.

Habitat.—Mountainous woods; rare.

Perennial; flowering in May and June.

The two following species are nearly allied, but readily distinguished from each other by the difference in the length of the bractees. The flowers are white and elegant, but without odour. Both species

are more frequent on the Continent than with us; and we have found the *E. ensifolia* the more common one, while in England it is the rarer of the two.

6. *E. rubra*, Swartz. (Fig. 1350.) *Purple Helleborine*. Leaves lanceolate; bractees longer than the downy ovary; sepals and petals ovate, acuminate, spreading, enclosing the three lobed lip, the middle lobe ovate, acuminate, marked with raised waved lines.

English Flora, vol. iv. p. 46.—Hooker, British Flora, ed. 4. vol. i p. 319.—Lindley, Synopsis, p. 259.—*Serapias*, Linn.—English Botany, t. 437.—*Cephal-anthera rubra*, Richard.

Root creeping, and with numerous simple fibres. *Stem* erect, simple, about a foot high, sheathed at the base with membranous scales, smooth below, slightly downy above. *Leaves* alternate, lanceolate, numerous ribbed, smooth, sessile, embracing the stem. *Inflorescence* a terminal spike of about six rose coloured flowers. *Bractees* linear lanceolate, about as long as the flowers. *Sepals* and *petals* ovate, taper pointed, all directed upwards, the *lip* slightly protruding between the petals, and rather longer, three lobed, white, the middle lobe oblong, ovate, acuminate, all the lobes on the inner surface are marked with waved elevated lines. *Column* elongated, rose colour. *Stigma* peltate, concave. *Pollen masses* greyish, oblong slightly cloven. *Caprules* slender, downy, ribbed, sessile, oblong.

Habitat.—Woods in mountainous districts in England; rare.

Perennial; flowering in June and July.

This rare species, with its beautiful delicate coloured flowers, is not apparently anywhere a common plant. We have found it occasionally in woods in the Appennines of Italy, and it is found also in other mountainous districts of the Continent.

GENUS XII. CORALLORHIZA.—HALL. *Coral-root*.

Nat. Ord. ORCHIDÆÆ. JUSS.

GEN. CHAR. *Sepals* and *petals* more or less coloured, arching or spreading, *lip* more or less lobed, spurred at the base. *Spur* often adhering to the ovary. *Column* free, plano-convex, entire. *Anthers* terminal, free, deciduous, round, two celled, with two anterior valves. *Pollen masses* four, spherical, solid.—Name κοράλλι ωρ, and ριζα, a *root*; in allusion to the curious form of the root.

1. *C. innata*, Brown. (Fig. 1354.) *Spurless Coral-root*. Spike of few flowers; sepals linear lanceolate, acute, the lower ones deflexed; lip oblong, obtusely lobed on each side at the base; spur very short, adnate.

English Flora, vol. iv. p. 50.—Hooker, British Flora, ed. 4. vol. i. p. 320.—Lindley, Synopsis, p. 258.—*Ophrys corallorhiza*, Linn.—English Botany, t. 1547.

Root fleshy, of thick branched divaricating horizontal fibres, of a pale yellowish brown colour, exhaling while drying a sweet odour. *Stem* erect, smooth, simple, slender, from six to twelve inches high, of a pale greenish white, bearing two or three membranous sheaths, with an acute point in the place of the leaves. *Inflorescence* a terminal spike of from five to ten drooping flowers, of a pale yellowish green colour. *Bractees* very short and small. *Sepals* linear lanceolate, acutely pointed, keeled, the two lower ones deflexed. *Petals* shorter than the sepals, erect, connivent. *Lip* recurved, oblong, slightly contracted in the middle, forming two obtuse lobes on each side near the base, white, or pale yellow, and more or less spotted with red. *Spur* very short, and united to the base of the lip. *Column* elongated, yellowish, curved at the back, channeled in front. *Anther* terminal, free, forming a kind of hood over the four globular *pollen masses*. *Capule* elliptic, three ribbed, crowned by the persistent flower.

Habitat.—Marshy wood in several parts of Scotland.

Perennial; flowering in June and July.

GENUS XIII. MALAX'IS.—SWARTZ. *Bog Orchis*.

Nat. Ord. ORCHID'ÆE. JUSS.

GEN. CHAR. *Sepals* herbaceous, ovate, spreading. *Petals* herbaceous, reflexed. *Lip* uppermost, much smaller than the sepals, not spurred, embracing the column at the base. *Column* very short, excavated in front. *Pollen masses* four, oblong. *Anthers* terminal, deciduous.—Name *μαλακίς*, softness; so called from the tender nature of the plants.

1. *M. paludosa*, Sw. (Fig. 1355.) *Marsh Bog Orchis*. Stem five-angled; leaves three to five, ovate, concave, papillose at the extremity; lip entire, concave, acute, erect, half as long as the perianth.

English Botany, t. 72.—English Flora, vol. iv. p. 48.—Hooker, British Flora, ed. 4. vol. i. p. 320.—Lindley, Synopsis, p. 263.—*Ophrys*, Linn.

Root bulbous, increasing by offsets (hybernaculi), which puts out radicles from the base. *Stem* erect, very fragile, slender, from one to four inches high. *Leaves* three or four, ovate or obovate, embracing the stem at the base, a pale somewhat glaucous green, concave, ribbed, rough, with papillose excrescences, or little bulbous germinæ, by which the plant may increase itself. *Inflorescence* a terminal spike of a few loose pale yellowish green flowers, very small. *Flowers* reversed. *Bractees* small, lanceolate, membranous. *Sepals* three,

ovate, acute, spreading, two pointed upwards, and the other downwards. *Petals* two, lateral, recurved, linear. *Lip* erect, very small, embracing the *column* at the base. *Pollen masses* small, four, oblong. *Capsules* nearly globular, strongly ribbed, on a short pedicel.

Habitat.—Spongy bogs in various places.

Perennial; flowering in July.

This very curious little plant is probably more common than is supposed, on account of its being often overlooked from its small size and inconspicuous appearance. The means which it has of increasing itself are very remarkable. It will have been observed that in most of the Orchises there is a double provision made for their increase, one in the tubers, and the other in the seeds; but in this little plant a third is added in the bulbous *germinæ* on the ends of the leaves, each of which is capable of producing a separate plant.

GENUS XIV. LIPARIS.—RICHARD. *Liparis*.

Nat. Ord. ORCHID'ÆE. JUSS.

GEN. CHAR. *Sepals* more or less herbaceous, spreading. *Petals* linear, spreading, *lip* undermost, much larger than the sepals, undivided, reflexed. *Column* nearly as long as the sepals. *Anthers* terminal, deciduous. *Pollen masses* four, oblong—Name *λίπαρος*, *fat*: in allusion to the soft unctuous feel of the plant.

1. *L. Læselii*, Rich. (Fig. 1356.) *Two-leaved Liparis*. Stem triangular, two leaved at the base; leaves broadly lanceolate; lip ovate, obtuse, recurved, longer than the sepals.

Hooker, British Flora, ed. 4. vol. i. p. 320.—Lindley, Synopsis, p. 263.—*Ophrys Læselii*, Linn.—English Botany, t. 47.—*Malaxis Læselii*, Swartz—English Flora, vol. iv. p. 49.—*Sturmia*, Reicheub.

Root of numerous fibres, forming at its crown by the side of the stem one or two scaly bulbs, which put out radicals, and form separate plants. *Stem* erect, triangular, simple, from six to eight inches high. *Leaves* two at the base, a bright green, smooth, broadly lanceolate, numerous ribbed. *Inflorescence* a terminal spike of from four to eight loose pale yellowish green flowers. *Bracteas* small, lanceolate. *Sepals* lanceolate, obtuse, spreading. *Petals* longer than the sepals, linear, spreading. *Lip* a rather deeper yellow, somewhat longer than the petals, obovate, obtuse, recurved, entire, or slightly crenated on the margin, channeled in front. *Capsule* elliptic, obovate, strongly ribbed, elevated on a short footstalk.

Habitat.—Sandy bogs amongst rushes, in Norfolk, Suffolk, and Cambridgeshire; but not common.

Perennial; flowering in July.

ORDER II.

DIAND'RIA. 2 STAMENS.

GENUS XV. CYPRIPE'DIUM.—LINN. *Lady's Slipper*.

Nat. Ord. ORCHIDÆ. E. JUSS.

GEN. CHAR. *Sepals* loosely spreading, *lip* very large, obtuse, inflated, slipper-shaped. *Column* terminated at the back by a petaloid lobe, (the sterile anther), and separating the anthers. The two anterior sepals often united.—Name from Κυπρίς, *Venus*; and παῖς, a slipper.

1. *C. Calceolus*, Linn. (Fig. 1357.) *Lady's Slipper*. Stem leafy, terminal lobe of the column nearly oval, incurved; lip somewhat laterally compressed, shorter than the perianth.

English Botany, t. 1.—English Flora, vol. iv. p. 52.—Hooker, British Flora, ed. 4. vol. i. p. 320.—Lindley, Synopsis, p. 263.

Root creeping, with numerous simple flesh fibres. *Stem* erect, from twelve to eighteen inches high, striated, downy. *Leaves* ovate, acute, numerous ribbed, somewhat downy at the back, embracing the stem at the base, three or four alternate, and often there is another at the top of the stem smaller, and when there is a second flower it is diminished into a bractea. *Flower* mostly solitary, terminal, large, conspicuous, very handsome. *Sepals* lanceolate, taper pointed, from an inch to an inch and a half long, of a rich brownish purple colour, the upper one erect, somewhat bent forward, the two others united under the lip, and appearing like a single one, bifid at the point. *Petals* the same colour, longer, narrower, waved on the margin. *Lip* large, handsome, yellow, netted with darker veins, internally spotted, inflated, oblong, obtuse, somewhat compressed laterally, about an inch long. *Column* prominent, terminating at the back by a stalked lobe, the barren stamen, and dividing the anthers, the lobe elliptic, obtuse, with two angles, the apex rounded with a short inflexed point. *Anthers* lateral, elliptical. *Capsule* elliptic oblong, obtuse, ribbed, and furrowed.

Habitat.—Woods in the North of England; rare.

Perennial; flowering in June.

This is the largest and most beautiful of our European Orchises. It is frequently cultivated as a border flower, but requires a shady situation, and a light peaty soil. There are some most beautiful species brought from North America, but require great care in their cultivation and protection from frost and moisture.



1357

Cypripedium calceolus.



1334

Habenaria chlorantha.



1340

Ophrys aranifera β . *fucifera.*



1358

Aristolochia clematitis.

ORDER III.

HEXAN'DRIA. 6 STAMENS.

GENUS XVI ARISTOLO'CHIÆ.—LINN. *Birthwort.*

Nat. Ord. ARISTOLO'CHIÆ. JUSS.

GEN. CHAR. *Perianth* single, tubular, mostly swollen at the base, the mouth dilated and elongated on one side into a ligula. *Anthers* six, sub-sessile, inserted into the style. *Stigma* six-cleft. *Capule* inferior, six celled, six angled.—Name from *αἰσος*, *excellent*; and *λοχος*, *birth*; from the supposed medical properties of some of the species.

1. *A. Clematidis*, Linn. (Fig. 1358.) *Common Birthwort*. Stem simple, erect; leaves ovate, heart shaped, petiolate, smooth; flowers erect, in axillary fascicles; lip oblong, shortly acuminate.

English Botany, t. 396.—English Flora, vol. iv. p. 53.—Hooker, British Flora, ed. 4. vol. i. p. 321.—Lindley, Synopsis, p. 225.

Roots long, fleshy. *Stem* erect, from one to two feet high, simple, round, leafy, zigzag, striated. *Leaves* alternate, a smooth bright green, of a leathery texture, heart-shaped, entire, much cut out at the base, ribs prominent. *Flowers* a pale yellowish buff colour, in axillary clusters, each on a simple footstalk, erect. *Perianth* single, superior, tubular, mostly swollen into a globose form at the base, the mouth dilated and elongated on one side into a simple acute lip. *Anthers* six, sessile in the tube of the perianth. *Style* short. *Stigma* globose, six lobed, concave. *Capules* large, oval, six angled, six celled. *Seeds* numerous, triangular.

Habitat.—Woods, thickets, and amongst ruins, especially in the Eastern and South Counties of England.

Perennial; flowering in July and August.

The roots of this species have been long considered serviceable as a stimulant in affections peculiar to females. It was used also as a stimulant and stomachic; but if taken in large doses it is violently emetic, and is now seldom used. This species is called *Clematidis*, in allusion to its resemblance to the young shoot of a vine. Sir J. E. Smith says, "A singular opinion is said to prevail in France, that this Aristolochia, if abundant in vineyards, spoils the quality of the wines." The roots of several species of Aristolochia are known by the name of *Serpentaries*, from the reputed effects of their juice upon venomous reptiles. Whatever credit may be given to the wonderful tales told of serpent charmers, it is, nevertheless, believed that the Egyptian snake jugglers stupify these reptiles by means of juice from the roots of *A. anguicida*. These roots are said to exhale a

strong penetrating odour, which is so disliked by serpents, that they will not approach within its influence, and that a traveller is secure from their coming near him by carrying a portion of the plant with him. So powerful, indeed, is this juice, according to Jacquin, that a few drops of it introduced into the mouth of a serpent, produces a kind of stupor or drunkenness; so much so that the reptile will allow itself to be handled with impunity, and if too large a dose is given it produces death. The same author further states that the juice of the plant applied to a wound from a serpent, or a decoction of the same taken internally, is an infallible cure. The flowers of some of the species are large and very splendid, and many of them very curious in their form.

CLASS XXI.

ORDER I.

MONŒCIA.

(*Stamens and pistils in separate flowers on the same plant*).

MONAN'DRIA. 1 STAMEN.

GENUS I. EUPHOR'BIA. LINN. *Spurge*.

Nat. Ord. EUPHOR'BIACEÆ. JUSS.

GEN. CHAR. *Involucre* of one piece, five-cleft, surrounded with five alternating glands. *Head* of numerous *barren flowers*, (ten to twenty, or more, each a single stamen, without calyx or corolla), surrounding the *fertile one*, (a single pistil, without calyx or corolla, elevated upon a pedicel). *Style* three-cleft. *Fruit* hanging out of the involucre, three celled, each cell bursting elastically at the back, containing one, rarely two, suspended *seeds*.—Name from *Euphorbus*, a Physician to Juba, King of Mauritania, who is said to have brought the plant into use.

1. ANISOPHYLLUM. Roper. *Leaves furnished with stipules*.

1. *E. Pe'plis*, Linn. (Fig. 1359.) *Purple Spurge*. Stem procumbent, branched, smooth; leaves oblong, oblique, lobed on one side, entire, or toothed, opposite; stipules small; glands of the involucre with small membranous scales beneath; capsules smooth, of three keeled valves; seeds obovate, angular, smooth, white.

English Botany, t. 2002.—English Flora, vol. iv. p. 62.—Hooker, British Flora, ed. 4. vol. i. p. 326.—Lindley, Synopsis, p. 220.

Root long, fibrous, a smooth somewhat succulent plant, of a glaucous hue, mostly deeply tinged with purple. *Stems* procumbent, branched and spreading, four to eight inches long. *Leaves* opposite, nearly sessile, oblong, with a round lobe on one side, obliquely cut on the other, entire, or finely toothed towards the base. *Stipules* small,



1359

Euphorbia peplis.



1360

Euphorbia helioscopia.



1361

Euphorbia platyphylla.



1362

Euphorbia hiberna.



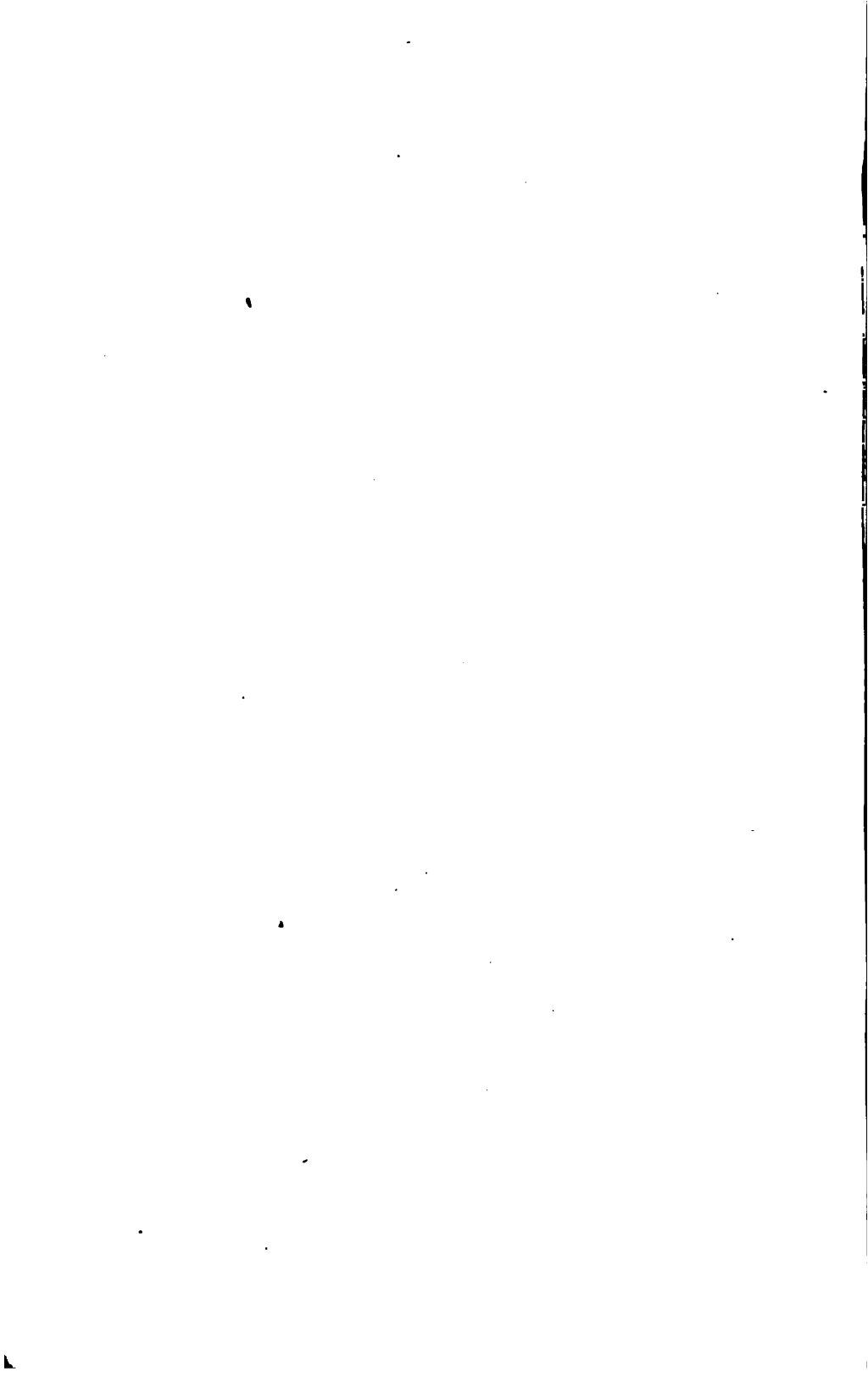
1363

Euphorbia pilosa.



1364

Euphorbia amygdaloides.



lanceolate, membranous. *Flowers* solitary, axillary, on a short stalk of the same colour as the plant. *Glands* of the involucre four, ovate, mostly with a few membranous scales beneath. *Capsules* reflexed, ovate, three lobed, three celled, the valves smooth, keeled, each cell containing an obovate smooth white seed.

Habitat.—Sandy coast, in Devonshire and Cornwall, and the Channel Islands—*Babington and Christy*.

Annual; flowering from July to September.

This species is readily distinguished, by its prostrate stems and oblique leaves. It varies in colour from glaucous green to a deep reddish purple; the smaller starved plants grown in a dryer situation are the deepest in colour. It is the *πικλῖς*, *Peplis*, of Dioscorides. It is frequent on the coast of the Mediterranean, and is less delirious than many others of the genus. It appears to have been used by the Greeks as a purgative medicine, but like most others of the genus it is too powerful for general use.

2. *TITHYMALUS*. Tournef. *Leaves without stipules*. § 1. *Glands of the involucre roundish, or transversely oval, not truly lunate, or horned*.

a. *Seeds netted*.

2. *E. Helioscopia*, Linn. (Fig. 1860.) *Sun Spurge*. Leaves membranous, obovate, wedge-shaped, obtuse, or notched, serrated towards the point, or entire, smooth; umbel of five principal branches; glands entire; capsules smooth; seeds netted and pitted.

English Botany, t. 883.—English Flora, vol. iv. p. 63.—Hooker, British Flora, ed. 4. vol. i. p. 326.—Lindley, Synopsis, p. 221.

Root tapering, the whole plant smooth, pale green, occasionally scattered over with a few hairs. *Stem* erect, about a foot high, mostly branched from the base, rarely upwards, round, often purplish, scattered over with leaves, which soon fall away. The stem and branches terminating in an *umbel*, usually of five branches, with a solitary flower in the axis of the branches, and bracteated leaf at the base of each, and each branch is divided at the top into three short branches, with a solitary flower in the axis of these also, each of these branchlets are furnished with smaller bracteas, and bear flowers. *Involucre* bell-shaped, bearing four roundish or ovate entire glands on the margin. *Capsules* smooth, three celled, the cells keeled, forming the angles of the capsules, each cell containing an ovate seed, beautifully netted and pitted.

Habitat.—Fields, gardens, and waste places; very common.

Annual; flowering in July and August.

The milky juice with which the plant abounds is very acrid; it is used by the country people as an application to warts, and when freely applied, induces an inflammatory action, which, if kept up, sometimes destroys the wart. From this use it has the common

name of Wart-wort in some parts of the country. The umbels are mostly of a bright shining yellow colour in the centre; and surrounded with the green bractea, have a pretty appearance, which has probably given to the plant the name of Sun Spurge.

b. *Seeds smooth.*

3. *E. platyphyl'la*, Linn. (Fig. 1361.) *Broad-leaved Warted Spurge.* Leaves membranous, broadly obovate lanceolate, acute, finely serrulated, hairy beneath, sessile, the lower ones petiolated; umbel of about five principal branches, three-cleft, and frequently with scattered peduncles beneath the umbel; bractea sub-triangular, ovate; glands of involucre ovate, entire; capsules warted; seeds smooth, brown.

Hooker, British Flora, ed. 4. vol. i. p. 326.—Lindley, Synopsis, p. 221.

β. stricta, Roper. The whole plant smaller.

Lindley, Synopsis, p. 221.—*E. stricta*.—English Botany, t. 333.—English Flora, vol. iv. p. 64.

Root tapering, zigzag, the whole plant a light green, becoming somewhat tawny with drying. *Stem* erect, from a few inches to eighteen high, round, smooth, hollow. *Leaves* numerous, especially above, spreading and deflexed, smooth on the upper surface, somewhat hairy on the under, broadly obovate lanceolate, acute, finely serrated, especially in the upper half, the upper ones sessile, dilated at the base into a somewhat heart-shape, the lower tapering into a footstalk. *Umbel* of about five principal branches, three-cleft above, and again sub-divided, and often from the axis of the upper leaves are short, simple, or slightly divided branches. *Bractea* all more or less triangular, ovate or heart-shaped, and mostly slightly serrated. *Involucre* bell-shaped, furnished with four roundish ovate yellow glands. *Capsules* roundish, obtusely three lobed, covered with small obtuse warts, three celled, each cell containing an ovate smooth brownish lead-coloured seed.

Habitat.—Corn fields, Abbourne, and near Henfield, Sussex, and Essex, Cambridgeshire, Kent, and Suffolk.

Annual; flowering in July and August.

4. *E. Hiber'na*, Linn. (Fig 1362.) *Irish Spurge.* Leaves membranous, elliptic lanceolate, entire, sessile, smooth, or pubescent; umbel of about five principal branches, three-cleft; bractea ovate; glands of involucre ovate, entire; capsules warted; seeds smooth, blackish brown.

English Botany, t. 1337.—English Flora, vol. iv. p. 65.—Hooker, British Flora, ed. 4. vol. i. p. 326.—Lindley, Synopsis, p. 221

Root tapering, whole plant a deep shining green. *Stem* erect, about two feet high, round, smooth, solid, leafy, rarely with lateral branches. *Leaves* numerous, scattered, sessile, elliptic lanceolate, entire, often obtusely pointed, quite smooth above, sometimes hairy

beneath. *Umbel* large, of five or six principal branches, which are cleft into three branchlets, and again sub divided. *Bractææ* ovate, entire, often yellowish. *Involucre* bell-shaped, with four broadly ovate glands, of a brownish purple colour, having four erect ovate scales, of a green colour between them. *Capsules* large, sub-globose, erect, three lobed, and more or less unequally warted, three celled, each cell containing a roundish smooth blackish brown seed.

Habitat.—Hedges and thickets in the South of Ireland ; between Feversham and Sittingbourn, Kent,—*Hudson*.

Perennial ; flowering in June.

The whole plant abounds with a very acrid milky juice, and Dr. Taylor says that it is extensively used by the peasantry of Kerry, for poisoning or rather stupifying fish, in the same manner as the exotic *E. piscatoria* : and the same author further states, that so powerful are its qualities, that a small creel or basket filled with the bruised plant suffices to poison the fish for several miles down a river. *Hooker, British Flora*. The properties of this genus resides in a peculiar resin, which forms the largest part of the milky juice. The resin found in the shops under the name of Euphorbium is chiefly obtained from the *E. officinalis*, as well as *E. antiquorum* and *E. canariensis*, plants growing in great abundance in the interior of Africa. They are shrubby plants, and the drug is obtained by making incisions in the branches, from which the milky juice exudes : the watery parts soon evaporate, and it is left in concrete tears of an oblong form, which are collected into masses for exportation. Its taste is acrid, and shortly produces inflammation in the mouth and throat if incautiously taken. According to the analysis of Brande, Euphorbium contains—

Resin.....	43.77	Lignin	5.60
Wax	14.93	Sulphate of Potash ...	0.45
Caoutchouc	4.84	Sulphate of Lime.....	0.10
Malate of Potash ...	4.90	Phosphate of Lime ...	0.15
Malate of Lime ...	18.82	Water	5.40

98.96

So corrosive is the resin of this compound, that it speedily blisters the skin when applied to it ; and, indeed, much caution is required with the fresh juice, for it, though not so corrosive, as the pure resin, equally produces inflammation and erosion of the skin. All our species of Euphorbia contain more or less of this acrid juice, but none of them are so acrid as the exotic species. Some of the leafless ones are furnished with numerous prickles on their sturdy stems, and in their native countries, Africa and Asia, are planted in hedge rows, and form most formidable fences ; the prickles pierce and tear the skin, and the acrid sap filling the wound produces excruciating pain

both to man and beast, so that they form an excellent protection to the natives. As a medicine for internal exhibition, Euphorbium is now abandoned, and is only used externally to produce blisters on the skin in veterinary practice. It is, however, sometimes added to the powder of the Blistering Fly (*Cantharis vesicatoria*); but the blisters thus produced, if too much of the Euphorbium is added, are more painful, and difficult to heal.

5. *E. pilo'sa*, Linn. (Fig. 1363.) *Hairy Spurge*. Leaves sessile, ovate lanceolate, scattered, hairy or smooth, entire, or finely serrated; umbel of about five principal branches, with several scattered inferior ones; bractees broadly ovate; glands of involucre oval, with intermediate erect rounded lobes; capsules warted, smooth or hairy; seeds glossy, smooth.

Hooker, British Flora, ed. 4. vol. i. p. 327.—Lindley, Synopsis, p. 329.

β. "Capsules dotted with minute brown warts, glabrous, or obsoletely hairy."

E. epithymoides, Babington.—Flora, Barth. p. 44. (not Linn.)—*E. pilosa*.—English Botany, Suppl. t. 2787.—Hooker, British Flora, ed. iv. vol. i. p. 327.

γ. "Capsules quite smooth and glabrous."

E. villosa, Waldst et Kit. Pl. Rar. Hung. vol. i. p. 96. t. 93.—*E. procera*, M. Bieb. Flora Taur. Cauc. vol. i. p. 378.—Reicheub. Ic. Bot. 2. t. 270.

Root thick, woody, black externally. *Stem* erect, from two to three feet high, smooth, reddish, and naked below, leafy above. *Leaves* scattered, ovate, or elliptic lanceolate, entire, or finely serrated towards the point, sessile, smooth, rarely finely pubescent above, paler and downy beneath. *Umbel* of about five principal branches, two or three times divided above, and often from the axis of the upper leaves are simple or divided branches. *Bractea* ovate, smooth, entire, or somewhat serrated. *Involucre* bell-shaped, with four transversely ovate glands, and with intermediate erect ovate entire lobes. *Capsules* globose, three lobed, more or less scattered over with purplish warts, and smooth, or more or less clothed with pellucid hairs, so as sometimes to be shaggy. *Seeds* quite smooth and shining.

Habitat.—Abundant in the hedges at Slinfold, Sussex, naturalized.—*Mr. Borrer*. β. plentiful in a lane and wood near Prior Park Lodge, near Bath.—*Mr. Babington*.

Perennial; flowering in July.

There is some doubt of this being more than a naturalized plant. It is not unfrequent on the Continent, and we find the stem and whole plant more or less pubescent in these plants, according to the drier or moist situation of its growth, and the size of the plant is also variable from the same causes. It abounds with a milky juice, and possesses the same properties as others of the genus.

E. coralloides, Linn., which has the umbel five-cleft, the bracteas ovate oblong, hairy, leaves lanceolate, minutely serrated, woolly, involucre glands transversely oval, the capsules nearly smooth and woolly, seeds obovate, minutely punctate, and with faint reticulate bands. The stem attains the height of three feet, and is usually naked below the umbel, is five-cleft, its branches three and two-cleft, and is more or less hairy. It has been found at Slinfold, Sussex, but supposed to have been introduced by the late Mr. Manningham. It is figured in English Botany, Suppl. t. 2837, but is scarcely deserving a place in our list of native plants.

2. *Glands of the involucre lunate, or lunate with two horns.*

a. *Seeds smooth, bractea connate.*

6. *E. Amygdaloides*, Linn. (Fig. 1384.) *Wood Spurge*. Leaves pubescent, obovate, or oblong lanceolate, tapering into a petiole, entire; umbel of numerous branches, bifid, and with several scattered peduncles from the axis of the upper leaves; glands of involucre lunate, two horned; capsules minutely warty; seeds smooth; bractea connate.

English Botany, t. 256.—English Flora, vol. iv. p. 68.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 233.

Root branched and knotty, somewhat woody, the whole plant clothed with soft pubescence, becoming brown, with drying. *Stems* mostly several, erect, or somewhat curved, rather woody, about two feet high, purplish below, very leafy. *Leaves* obovate, or oblong lanceolate, tapering towards the base into a footstalk, entire, paler, and more downy beneath, the upper leaves shorter, more ovate, and from their axis arise simple pedicles. *Umbel* of several principal branches, slender, bifid above. *Bractea* roundish ovate, united at the base in a connate manner, pale yellowish green, quite smooth, or nearly so. *Involucre* bell-shaped, smooth, or slightly downy, the glands lunate, horned, yellow, with an erect ovate intermediate lobe. *Capsule* rather large, globose, three lobed, minutely dotted over with warts. *Seeds* roundish ovate, smooth brown.

Habitat.—Wood and thickets in England, especially in a clayey soil; South of Ireland.

Perennial; flowering in March and April.

7. *E. Chara'cias*, Linn. (Fig. 1365.) *Red Shrubby Spurge*. Leaves linear lanceolate, tapering into a petiole, entire, smooth, or pubescent; umbel of numerous branches, bifid, downy, and numerous peduncles from the axis of the upper leaves; glands of involucre lunate, scarcely two horned; capsules hairy, woolly, and with elevated points when young; seeds smooth; bractea connate, nearly plane.

English Botany, t. 442.—English Flora, vol. iv. p. 68.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 223.

Root branched, woody. *Stem* shrubby, erect, about three feet

high, round, striated, downy, hollow, leafy, of a purplish brown below. *Leaves* linear lanceolate, acute, somewhat mucronate, tapering into a footstalk, entire, a dark green, smooth, or slightly downy above, paler and pubescent beneath, the upper leaves from the axis of which arise simple peduncles, are shorter, broader, and sometimes sessile. *Umbel* of numerous downy principal branches, bifid above. *Bractea* nearly smooth, roundish, or ovate, acute, united at the base in a connate manner, almost flat, spreading, dark green. *Involucre* bell-shaped, downy, the *glands* lunate, obtuse, scarcely ever horned, a dark lurid purple. *Capsules* large, ovate, downy, obtusely three lobed, when young woolly and rough, with elevated points. *Seeds* oblong, smooth, pale brownish white.

Habitat.—Needwood Forest, Staffordshire; a doubtful native. Perennial; flowering in March and April.

This is a larger species than the last, and readily distinguished by its darker leaves and flowers, and by the dark purple lunate not horned glands of the involucre, and the hairy capsules. It is often cultivated in gardens, on account of its handsome appearance, but its odour is foetid and unpleasant.

b. *Seeds smooth, bractea free.*

8. *E. Esula*, Linn. (Fig. 1366.) *Leafy Branched Spurge*. Leaves lanceolate oblong, smooth, mostly entire; umbel of numerous principal branches, bifid, and several scattered peduncles from the axis of the upper leaves, glands of involucre lunate, two horned; capsules smooth, or with slightly elevated points at the back; seeds obovate, smooth; bractea triangular, ovate, obtuse, or acuminate, with a bristle point; root creeping.

English Botany, t. 1399.—English Flora, vol. iv. p. 65.—Hooker, British Flora, ed. 4. vol. i. p. 327.—Lindley, Synopsis, p. 221.

Root creeping, the whole plant a smooth light green. *Stem* erect, round, from twelve to eighteen inches high, simple, or with several barren lateral branches. *Leaves* scattered, numerous on the branches, linear or linear lanceolate, the lower ones tapering towards the base, the upper sessile, entire, or sometimes unequally serrated on the margin, from the axis of the upper ones frequently arise slender simple peduncles. *Umbel* of several slender smooth principal branches, bifid at the extremity. *Bractea* triangular, ovate, with an acute point, or transversely ovate, with a short acuminate point, sometimes mucronated. *Involucre* smooth, bell-shaped, with four lunate two horned glands, of a deep lurid purple colour. *Capsules* ovate, smooth, finely punctated with elevated points when young, obtusely three lobed. *Seed* obovate, smooth, of a greyish brown colour.

Perennial; flowering in July.

9. *E. Cyparissias*, Linn. (Fig. 1367.) *Cypress Spurge*. Leaves



1365

Euphorbia characias.



1366

Euphorbia esula.



1367

Euphorbia cyparissias.



1368

Euphorbia paralias.



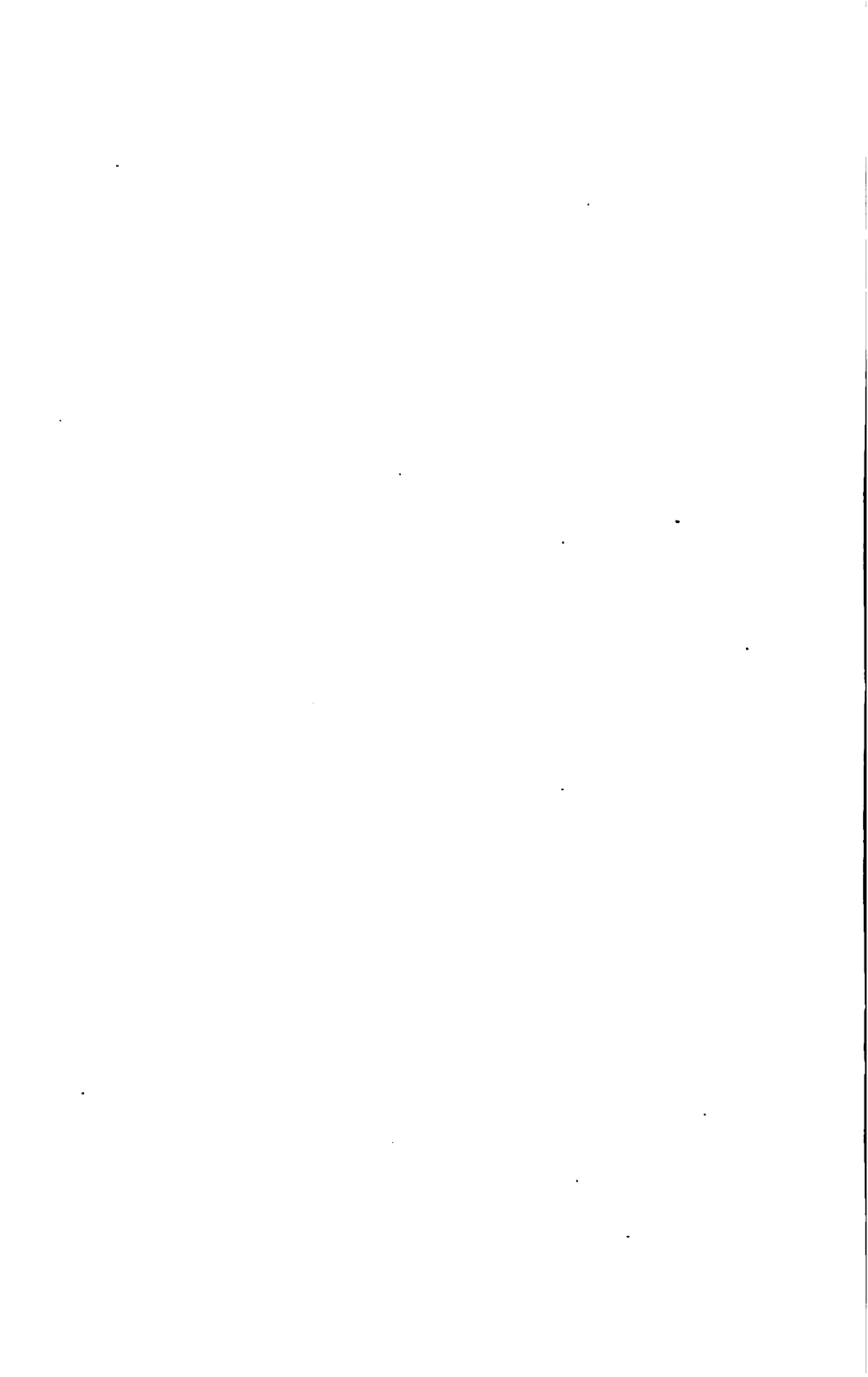
1370

Euphorbia setatilis.



1371

Euphorbia exigua.



linear, entire, smooth, obtuse or pointed, sessile; umbel of numerous principal branches, bifid, and several scattered peduncles from the axis of the upper leaves; glands of involucre lunate, two horned; capsules smooth or rough, with elevated points; seeds obovate, smooth; bractea sub-triangular, ovate, or transversely ovate, acuminate, with a bristle point.

English Botany, t. 340.—English Flora, vol. iv. p. 36.—Hooker, British Flora, ed. 4. vol. i. p. 327.—Lindley, Synopsis, p. 221.

Root woody, with long creeping branches, the whole plant smooth, of a pale somewhat glaucous green. *Stems* several, erect, about two feet high, round, leafy, and with several lateral mostly barren branches from the upper part of the stem, which rise above the umbel. *Leaves* scattered, linear, entire, sessile, obtuse, or acutely pointed, narrower, and more numerous on the branches. *Umbel* of numerous slender smooth principal branches, bifid, and with several often numerous peduncles from the axis of the upper leaves. *Bractea* mostly yellowish green, sub-triangular ovate, or transversely ovate, with an acute or obtuse point, terminating in a short bristly point. *Involucre* bell-shaped, smooth, with four lunate two horned glands, of a yellowish colour, becoming tawny. *Capsules* globose when young, roughish, with numerous elevated points, becoming smooth. *Seeds* obovate, smooth, white, or greyish brown.

Habitat.—Woods; Staffordshire, Bedfordshire, and Northumberland.

Perennial; flowering in June and July.

The linear leaves and long barren branches overtopping the umbels readily point out this plant. The bracteas become a fine scarlet after flowering, and look extremely pretty. It is doubtful if either this or *E. Esula* are more than naturalized plants; they are both frequent on the Continent, and have probably been hence introduced. This, as well as *E. corollata*, are possessed of emetic and purgative properties, and not so acrid as some other of the species; they are used in North America in dropsical affections, and it is reported by Drs. Kean and Coxe, with considerable success: the dose is from eight to twenty grains of the powdered root, which produces copious evacuations. It, however, requires considerable care in the administration. When the plant is eaten in any quantity by sheep and other animals, it is poisonous; but when in only a moderate proportion with the food, its effects will be obviously that of a stimulant to the digestive organs, and in many cases useful to the cattle. Many other of the species of this genus are used in various affections. The *E. ophthalmica*, a native of South America, is used by the natives in Rio Janeiro, by dropping the expressed juice into the eye in cases of ophthalmia. The *E. dulcis* and *E. edulis* are less acrid than many of the other species; and in Cochin China the leaves of the latter are dressed and mixed with other green vegetables as a salad.

10. *E. paralias*, Linn. (Fig. 1368.) *Sea Spurge*. Leaves thick and leathery, lanceolate and obovate lanceolate, sessile, crowded, mostly imbricated, obtuse, or acute, glaucous, entire; umbel of about five principal branches, often with inferior scattered ones; glands lunate, often crowded; bractea transversely ovate, concave; capsule ovate, with wrinkled elevated lines; seeds smooth.

English Botany, t. 195.—English Flora, vol. iv. p. 63.—Hooker, British Flora, ed. 4. vol. i. p. 327.—Lindley, Synopsis, p. 222.

Root woody. *Stems* several, about a foot high or more, woody at the base, and purplish, smooth, and the rest of the plant of a glaucous green, whiteish when dry. *Leaves* very numerous, crowded in an imbricated manner, all sessile, entire, somewhat concave, the lower ones lanceolate or linear lanceolate, acute, the upper ones more ovate, obtuse, of a leathery somewhat fleshy texture. *Umbel* of about five principal rays, bifid. *Bractea* entire, transversely ovate, concave, without or with a short point. *Involucre* bell-shaped, smooth, with five lunate glands, elevated on short stalks, often unequally crowded on the margin. *Capsule* ovate, three lobed, rough, with rugose lines and dots on the back. *Seeds* roundish ovate, smooth, or slightly sculptured, grey or whiteish.

Habitat.—Sandy sea coasts of England, and near Dublin; not common.

Perennial; flowering in August and September.

c. *Seeds netted or pitted, leaves alternate or scattered.*

11. *E. segetalis*, Linn. (Fig. 1370.) *Portland Spurge*. Leaves linear, acuminate, mucronate, sessile, or tapering into a petiole, smooth; umbel of five principal branches, often with inferior scattered ones; glands lunate, with two long horns; bractea sub-reniform, with a mucronate point; capsules ovate, three lobed, with a smooth line at the back, and wrinkled and rough, with elevated points; seeds ovate, netted and pitted.

Lindley, Synopsis, p. 222.

β. maritima, Roper. Bractea broad, sub-cordate, slightly mucronate.—*E. Portlandica*, Linn.—Lindley, Synopsis, p. 222.—English Botany, t. 441.—English Flora, vol. iv. p. 62.—Hooker, British Flora, ed. 4. vol. i. p. 327.

Root long, slender, much branched, the whole plant smooth, and of a pale somewhat glaucous hue. *Stem* ascending, about a foot high, round, simple, or branched, becoming purplish below. *Leaves* numerous, scattered, of a membranous texture, linear, with an acuminate point, sessile, the lower ones tapering into a footstalk, the upper ones broader, larger, sessile. *Umbel* of about five principal branches, bifid, and mostly from the axis of the upper leaves are simple peduncles. *Bractea* sub-reniform, or triangular, heart-shaped, entire, with an acute bristle point. *Involucre* bell-shaped, smooth, with four lunate glands, having two long horns, yellow. *Capsules*

sub-globose, with three obtuse lobes, each lobe with a smooth depressed line down the back, and on each side more or less waved with rough elevated dots, each cell containing an ovate seed, of a brownish colour, with a central line, and netted, and more or less pitted all over.

Habitat.—Sandy sea coasts in the South and West of England, Wales, Isle of Man, South of Scotland, and about Dublin, Ireland; but not common.

Perennial; flowering in August.

This is a variable plant in size; specimens which we have from Portland Isle are above a foot high, scarcely branched, and of a somewhat leathery texture. Those which we have from near the Mull of Galloway, Scotland, are scarcely half the size, more branched and bent at the base, and the leaves of a more membranous texture.

12. *E. exig'ua*, Linn. (Fig. 1271.) *Dwarf Spurge*. Leaves membranous linear, or linear, wedge-shaped, acute, or obtusely pointed, with a mucro, smooth, entire, sessile; umbel mostly of three principal branches, bifid; glands lunate, with long horns; bractees ovate lanceolate, or wedge-shaped; capsules smooth, or nearly so; seeds obovate, netted, brownish.

English Botany, t. 1336.—English Flora, vol. iv. p. 60.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 222.

Root long, slender, the whole plant smooth, of a pale somewhat glaucous green. *Stem* erect, simple or branched from the base, slender, leafy. *Leaves* sessile, narrow, linear, or tapering towards the point in a wedge-shaped manner, or linear and dilated at the point, and truncated with a mucro, forming a somewhat three lobed apex. *Umbel* mostly of three principal branches, sometimes five, bifid. *Bractea* ovate lanceolate, or wedge-shaped, and often somewhat heart-shaped at the base. *Involucre* bell-shaped, smooth, its glands four, lunate, with two long slender horns. *Capsule* sub-globose, three lobed, each lobe keeled at the back, and more or less rough, with somewhat elevated points, or quite smooth. *Seed* ovate, somewhat four angled, a whiteish or ash colour, covered over with a net work of elevated warts.

Habitat. Corn fields, especially in a sandy soil; frequent.

Annual; flowering in July.

This is the smallest of our Euphorbias, and one of the most variable. Sometimes it is erect, and scarcely branched, about a foot high; at others not more than three or four inches high, much branched and spreading, forming a very bushy little plant. When the ends of the leaves are dilated and lobed, it is the *E. rubra*, De Cand. Flora. Fe., and *E. diffusa*, Jacq. misc. 2. p. 311. ic. rar. t. 88.

13. *E. Pe'plus*, Linn. (Fig. 1372.) *Petty Spurge*. Leaves membranous, broadly obovate, entire, petiolated, the lower ones orbicular,

smooth; umbel of about three principal branches, bifid; glands lunate, with very long horns; bractæas ovate; capsules sub globose, three lobed, each lobe with a double winged keel, and roughish; seeds obovate, cylindrical, longitudinally furrowed and pitted, greyish white.

English Botany, t. 959.—English Flora, vol. iv. p. 60.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 222.

Root fibrous, the whole plant smooth, light green. *Stem* erect, about a foot high, simple, or mostly branched at the base. *Leaves* scattered, few, entire, of a membranous texture, obovate, petiolated, smooth, the lower ones more orbicular, often notched at the apex. *Umbel* of three principal branches, spreading, bifid, and often from the axis of the upper leaves are slender peduncles. *Bractæa* ovate, heart-shaped, acute, sessile. *Involucre* bell-shaped, smooth, with four lunate glands, with long awl-shaped horns. *Capsule* sub-globose, three lobed, with a double winged membranous keel, somewhat warted, smooth, each cell with a single seed, of a greyish white colour, marked with two longitudinal furrows, and deeply pitted.

Habitat.—Waste and cultivated grounds; very common.

Annual; flowering in July and August.

The seeds of this plant are said to be occasionally used when other cathartics have failed, to produce the effect. The dose is from twelve to fifteen grains. It requires, however, great caution in its use, the effects of ten being so drastic, as to produce a continued fluid discharge from the bowels, greatly weakening, and often troublesome to stop.

d. *Seeds rugose, leaves apposite.*

14. *E. Lathy'ris*, Linn. (Fig. 1378) *Caper Spurge*. Leaves somewhat leathery, opposite, linear oblong, sessile, entire, or cordate at the base; umbel of three or four principal branches, repeatedly bifid; glands lunate, two horned; bractæas oblong, ovate, acute; capsules with a longitudinal furrow, smooth; seeds obovate, truncate, rugose, brown.

English Botany, t. 2255.—English Flora, vol. iv. p. 61.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 222.

Root of strong fibres. *Stem* erect, solitary, hollow, stout, purplish, with a glaucous hue, from two to three feet high, leafy. *Leaves* of a dark glaucous green, paler beneath, and quite smooth, opposite, from three to four inches long, linear, oblong, with a stout mid-rib, all sessile, the upper ones lobed in a heart-shaped manner at the base. *Umbel* of about four principal branches, repeatedly forked, and from the axis of the upper leaves arise branches, bearing small umbels. *Bractæa* oblong, ovate, acutely pointed, and similar in texture and colour to the leaves. *Involucre* obtusely bell-shaped, with four lunate glands, more or less obtusely horned, elevated on broad stalks. *Capsule* sub-globose, three lobed, each lobe with a longitudina¹



1372

Euphorbia peplus.



1373

Euphorbia lathyris.



1374

Callitriche verna.



1375

Callitriche platycarpa.



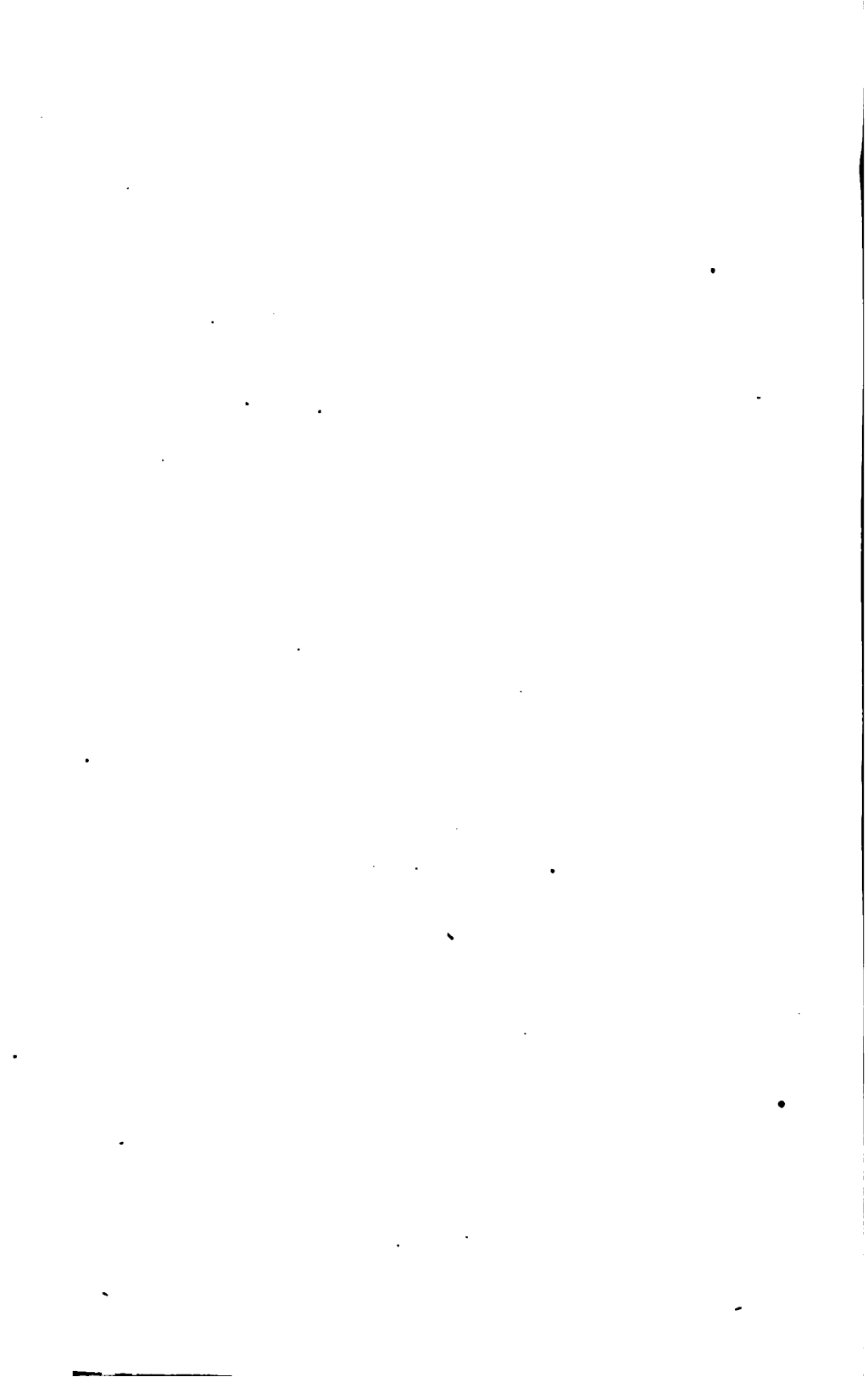
1376

Callitriche pedunculata.



1377

Callitriche autumnalis.



furrow, smooth, but somewhat rugose in a dried state. *Seeds* obovate, truncated at the base, rugose, brown.

Habitat.—Thickets in stony places; about Upton, near Reading, Berks; on the declivities of the Steep Holmes, in the Severn; Crawfurdland, near Kilmarnock; Comrie Den, near Dunfermline.—*Dr. Dewar*.

Biennial; flowering in June and July.

The seeds of this species, like the former, have been used as a cathartic, but require the same caution in their administration as those of that species. From the resemblance of the capsules to the bud of the caper plant, they have been pickled in vinegar, and used as sauce in the same manner; but their very great acidity must render them at least a dangerous condiment. The active properties of these capsules resides in the oil contained in the albumen of the seeds, which may be expressed, and is found as active as the seeds themselves, three to eight drops is a dose. Its properties are similar to the oil expressed from the seeds of the *Croton Tiglium*, a plant of the same natural order; the oil from the seeds of the latter plant is, perhaps, the most powerful cathartic known, and judiciously administered, one of the most useful medicines in many cases where an action of the bowels is required to be speedily produced. Combined with oil of turpentine, it forms one of the most efficacious external applications, shortly producing inflammation, and a numerous crop of small pustules upon the skin, wherever applied; and in some cases thus externally applied, it acts also as a cathartic. The *Ricinis communis*, Castor Oil plant, or Palma Christi, is another plant of this order, well known for the valuable cathartic oil expressed from its seeds; and many other plants of this order furnish most valuable medicines, but all of them excitants, which in some instances is combined with a nutritious amylaceous matter, as in the root of the *Jatropha Manihot*, or Cassava, the expressed juice of which is a most violent poison, while the residue forms a most bland and nutritive food of the Indians, known by the name of Cassava. As another instance of the wholly innocuous productions of the most active order of plants, we may mention *Caoutchouc*, or Indian rubber, which is obtained from many of the species of this order: and as an example of one of the still more extraordinary productions of the vegetable kingdom, the *Tallow-tree*, of China, a species of *Stillingia*. The oil expressed from the seeds of *S. sebifera*, becomes, by exposure to cold, as hard as suet or common tallow, and after it has been boiled, is as hard as bees'-wax; but to enumerate more of the exotic plants of this order, would extend beyond the province of this work.

GENUS II. CALLITRICHE.—LINN. *Water Starwort.*

Nat. Ord. HALORAG'Æ. BROWN.

GEN. CHAR. *Flowers* generally monœcious. *Perianth* of two petaloid pieces, *barren flowers* a single *stamen*, with a filiform *filament*. *Anther* one celled, two valved. *Fertile flower* with its *ovary* four angled, four celled. *Styles* two. *Capsules* four celled, four seeded, indehiscent. *Seed* peltate. *Radicle* very long, curved, superior. *Cotyledons* very short.—Name *καλός*, *beautiful*; and *βῆξ*, *hair*; in allusion to the long slender hair-like stems.

1. *C. ver'na*, Linn. (Fig. 1374) *Vernal Water Starwort*. Leaves of the lower branches linear, the upper ones obovate, three ribbed; fructiferous peduncles very short, with two falcate bractea at the base; styles long, erect; fruit tetragonal, the angles keeled.

English Flora, vol. iv. p. 10.—Hooker, British Flora, ed. 4. vol. i. p. 328.—Lindley, Synopsis, p. 243.—*C. aquatica*.—English Botany, t. 722.

Root long slender branches from the lower joints. *Stems* filiform, branched, with distant pairs of leaves below, crowded into a star-like form, and floating on the surface of the water at the top of the branches. *Leaves* thin, pellucid, the lower ones linear, of greater or less length, often spatulate, single ribbed, opposite and distant, the upper ones spatulate, crowded into a star-like form, obovate or spatulate, three ribbed. *Stamen* with a long slender *filament*, its *anthers* of two roundish ovate separate cells. *Capsule* subglobose, four celled, four lobed, elevated on a short peduncle, nearly sessile, each lobe obtusely keeled, and containing a thin peltate *seed*. *Bractea* at the base of the capsules, two membranous, falcate, conspicuous.

Habitat.—Ditches, pools, and slow streams; very common.

Annual; flowering in April and May.

The leaves are very variable in size and length, according to the depth of the water and the rapidity of the stream.

2. *C. platycarpa*, Kütz. (Fig. 1375.) *Broad-fruited Water Starwort*. Leaves of the lower branches linear, the upper ones obovate, three ribbed; fructiferous pedicels very short, with two falcate bractea at the base; styles long, erect in the flower, reflexed closely over the fruit; fruit nearly sessile, the lobes in parallel pairs, the angles keeled.

English Botany, Supp. t. 2864.—Babington, British Botany, p. 108.

This species is similar to *C. ver'na*, from which it is distinguished by the *fruit* being larger, paler, and its lobes being in parallel pairs,

slightly winged at the back. The *styles* are erect when it is in flower, but as the fruit approaches maturity, they become closely reflexed over it. The two species frequently grow together in shallow muddy water.

Habitat.—Shallow muddy water; frequent.

Annual; flowering during the summer months.

3. *O. pedunculata*, De Cand. (Fig. 1376.) *Pedunculated Water Starwort*. Leaves all linear, single ribbed, notched at the apex; fructiferous peduncles more or less elongated, without bractea at the base; styles long, very fugacious; fruit tetragonal, the angles keeled.

Hooker, British Flora, ed. 4. vol. i. p. 329.—Lindley, Synopsis, p. 243.—*O. autumnalis*.—English Botany, Supp. t. 2606.

Root long, simple slender fibres from the joint of the lower leaves, the whole plant submersed. *Stem* long, slender, filiform, branched. *Leaves* all linear, dark green, single ribbed, sessile, with the apex notched or obtuse. *Barren* and *fertile flowers* without bractea, or very small and fugacious. *Stamen* with a slender *filament* and roundish two celled *anther*. *Capsules* elevated on a distinct peduncle, sub-globose, four lobed, bluntly keeled at the back.

Habitat.—Ditch at Amberley, Sussex.—*Mr. Borrer*.

Annual; flowering in July.

4. *O. autumnalis*, Linn. (Fig. 1377.) *Autumnal Water Starwort*. Leaves all linear, broader at the base, narrow upwards, and notched at the apex, sessile, single ribbed; fructiferous peduncle very short, without bractea at the base; fruit with its lobes broadly winged at the back.

English Botany, Supp. t. 2732.—English Flora, vol. iv. p. 10 — Hooker, British Flora, ed. 4. vol. i. p. 329.—Lindley, Synopsis, p. 243.

Root creeping, and with slender fibrous branches from the joint of the lower leaves, the whole plant submersed. *Stem* long, slender, filiform, branched. *Leaves* all linear, dark green, single ribbed, pale, and somewhat cartilaginous on the margin, sessile, broader at the base, gradually narrowing towards the abrupt or notched apex, much larger than those of the last species. *Barren* and *fertile flowers* without bractea. *Stamen* with a rather long slender *filament*. *Anthers* two celled. *Capsules* elevated on a short peduncle, but concealed by the lobes, which are ovate, with a broad waved dilated keel.

Habitat.—Ditches near London; Anglesea, Loch of Cluny, Scotland.

Annual; flowering from June to October.

Readily distinguished by its long linear leaves broader at the base, and especially known by the capsules being much larger than *O. pedunculata*, and the lobes broadly keeled and waved. The thin almost transparent leaves of these plants are beautiful examples of the cellular structure of leaves, and in thus examining the different

species, it will be seen how much larger the cells are in one species than another. The *C. verna*, the most common of the genus, grows in great abundance in most pools and slow streams, and though by no means an attractive plant from its external beauty, is, nevertheless, of great utility in purifying the water, and affording covering and food to fish and numberless insects.

——— "If the thing we seek

Be genuine knowledge, bear we then in mind
How, from the lofty throne, the sun can fling
Colours as bright on exhalations bred
By weedy pools or pestilential swamp,
As by the rivulet sparkling where it runs,
Or the pellucid lake."

GENUS III. ZANNICHELLIA.—LINN. *Horned Pondweed.*

Nat. Ord. POTAM'ÆE. JUSS.

GEN. CHAR. *Flowers* solitary, *barren flower* a single naked stamen, inserted at the outside of the base of the perianth of the *fertile flower*, which is campanulate, surrounding two to six ovaries. *Stigma* peltate. *Fruit* dry, single seeded, compressed, gibbous, crenated externally.—Named in honour of John Jerome Zannichelli, a Venetian apothecary and botanist.

1. *Z. palustris*, Linn. (Fig. 1378) *Common Horned Pondweed*.
Anthers of four cells; style long; stigma entire.

English Botany, t. 1844.—English Flora, vol. iv. p. 70.—Hooker, British Flora, ed. 4. vol. i. p. 329.—Lindley, Synopsis, p. 251.

Root long slender fibres. *Stem* long, slender, thread-shaped, much branched and leafy, floating. *Leaves* opposite, linear, very narrow, entire, acute, or sometimes emarginate at the point. *Flowers* axillary, enveloped in a membranous *bractea*, containing the *barren flower*, a single stamen, with a long white filament, and an oblong four celled anther, *fertile flower* on a short stalk, its *perianth* bell-shaped, cloven, containing four or five oblong compressed ovaries, each on a short footstalk, somewhat keeled and toothed at the back. *Style* half as long, or as long as the fruit. *Stigma* peltate. *Capsules* oblong, incurved, somewhat compressed, one celled, one valved, single seeded.

Habitat.—Pools, ditches, and stagnant water.

Annual; flowering in August.

This, like most other water plants, is very variable, in its different parts being elongated or contracted by the increase or diminution of the water; when the stems are much elongated, it is the *Z. major*, Reichenbach; when grown in shallow water, with the roots creeping,



1378 *Zannichellia palustris.*



1379 *Zostera marina.*



1380 *Sparganium ramosum.*



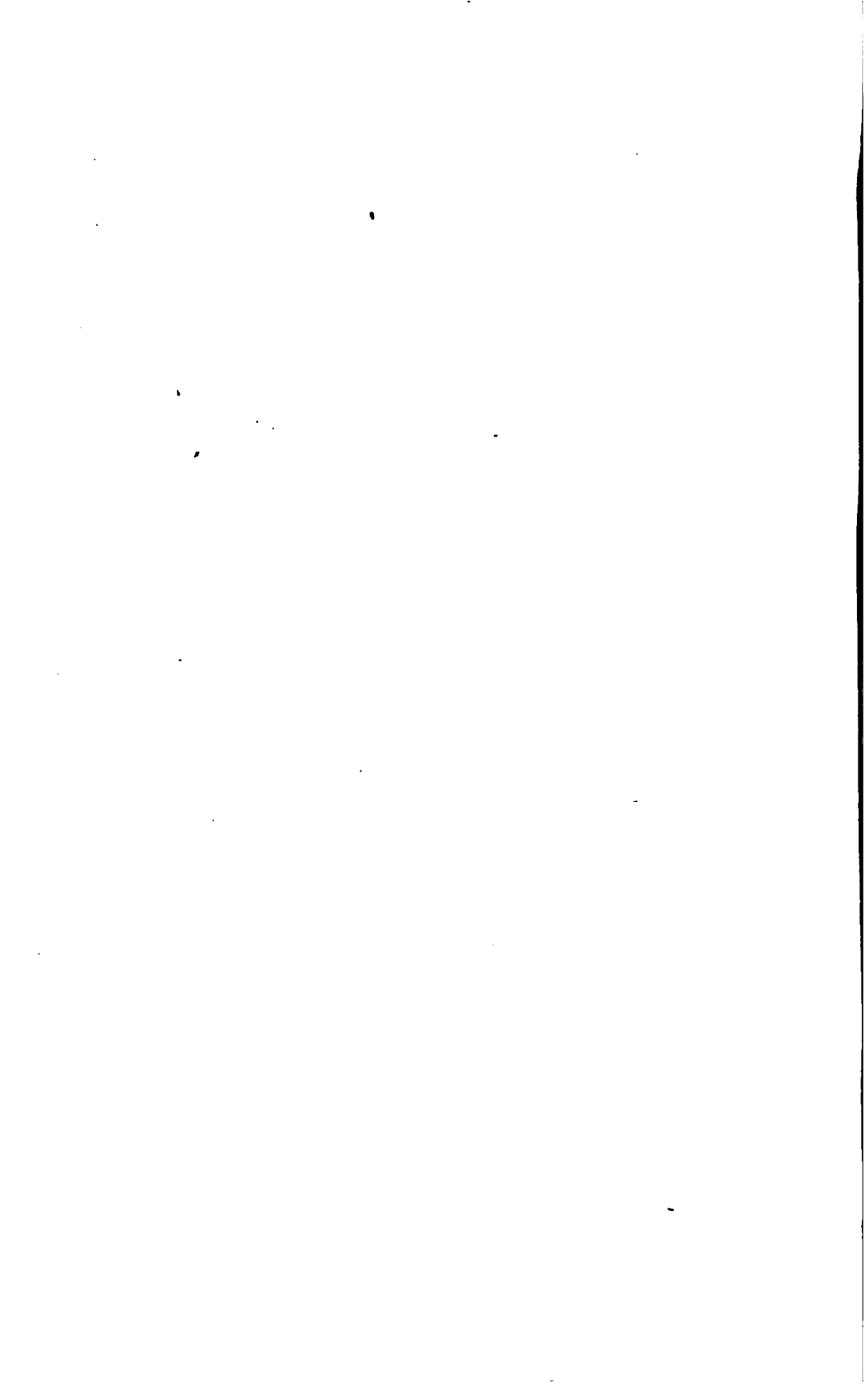
1381 *Sparganium simplex.*



1382 *Sparganium natans.*



1386 *Carex dioica.*



it is the *Z. repens*, Reich.; and when the fruit is elevated on elongated stalks, it is the *Z. gibberosa* and *Z. pedunculata*, of the same author.

GENUS IV. ZOSTE'RA.—LINN. *Grass-wrack*.

Nat. Ord. NAU'DES. JUSS.

GEN. CHAR. *Stamens* and *pistils* inserted in two rows upon one side of a spadix. *Spatha* foliaceous. *Stamens* sessile. *Anthers* alternating with the ovaries. *Ovary* ovate. *Style* bifid. *Fruit* a one sided nut.—Named from ζώνη, a girdle or belt, or ribbon, which the leaves resemble.

1. *Z. marina*, Linn. (Fig. 1379.) *Common Sea Grass wrack*. Leaves linear, entire, obscurely three ribbed; stem somewhat compressed; nuts striated.

English Botany, t. 467.—English Flora, vol. i. p. 5.—Hooker, British Flora, ed. 4. vol. i. p. 329.—Lindley, Synopsis, p. 251.

Root long fibres, in numerous whorls on the creeping stems, the whole plant growing under water. *Stems* of greater or less length, somewhat compressed. *Leaves* very long, linear, flat, alternate, obscurely three ribbed, and sheathing at the base, the sheaths contain the linear *spatha*, opening longitudinally. *Flowers* green, arranged on one side of the membranous spadix, in two rows, and destitute of perianth. *Pistils* and *anthers* alternate, usually there are two anthers, then one pistil, but it is not uncommon to find them arranged with one anther and one pistil side by side, *Anther* sessile, cylindrical, tapering at each end, one cell attached at the back, bursting irregularly. *Ovary* ovate, attached at the back, crowned with a bifid spreading style. *Fruit* a membranous capsule, ovate, striated, containing a single ovate flattish seed.

Habitat.—Creeks, the mouths of rivers, and salt water ditches; frequent.

Perennial; flowering in August and September.

The long soft leaves of this plant form an excellent material for packing glass and other brittle wares, and they are used also for making platted coverings to flasks, bottles, &c., and it is related by Pallas that it is found among pottery in old tombs in the South of Russia. The most useful purpose, however, to which it is applied, is that of making mattresses; it is light and soft, and is said to be intolerant to vermin. It is sold in the shops for this purpose under the name of "*Alva marina*," or the *Marinas Grass-wrack*.

The student whose mind is imbued with the love of contemplating the works of nature in all her minute forms, and finds in them the hand of perfection and simplicity, is no less capable of feeling the

presence of the Almighty in the grand display of might and power in the more stupendous works of His creation; and he who collects this little *Zostera*, nurtured in the bosom of "the Great Deep," will not the less recognise in this humble plant, the object of his search, the presence of that Being who is here felt to be presiding over the awful abyss, the semblance of Eternity.

"Thou glorious mirror, where the Almighty's form
Glasses itself in tempests; in all time,
Calm or convulsed—in breeze, or gale, or storm,
Icing the pole, or in the torrid clime
Dark-heaving;—boundless, endless, and sublime—
The image of Eternity—the throne
Of the Invisible; even from out thy slime
The monsters of the deep are made; each zone
Obeys thee; thou goest forth, dread, fathomless, alone."

Byron, Child Harold's Pilg., canto. 4., stanz. 83.

ORDER III.

TRIAN'DRIA. 3 STAMENS.

GENUS V. SPARGANIUM.—LINN. *Bur-reed.*

Nat. Ord. TYPHACEÆ. JUSS.

GEN. CHAR. *Flowers* in naked globose heads. *Barren flowers* with a single *perianth*, of three pieces and six *stamens*, the *anthers* wedge-shaped. *Fertile flowers* with a single *perianth*, of three pieces, surrounding a solitary superior ovary. *Fruit* sessile, single seeded.—Name *σπαργανον*, a little band, or *swathing clothes*, in allusion to the long band-like leaves, similar to the bandage used in the South for swathing young children, rolling round the legs and body, so that they cannot move, causing them to look more like bundles than living children.

1. *S. ramo'sum*, Huds. (Fig. 1380.) *Branched Bur-reed.* Leaves triangular at the base, their sides concave; common flower stalk branched; stigma linear.

English Botany, t. 744.—English Flora, vol. iv. p. 74.—Hooker, British Flora, ed. 4. vol. i. p. 330.—Lindley, Synopsis, p. 247.

Root with long branched fibres. *Stem* erect, stout, smooth, angular, about three feet high, terminating in several flowering branches, the lower branches with long leafy bractea, sheathing at the base. *Leaves* long, linear, sword-shaped, striated, smooth, the radical ones angular, concave, keeled, and enclosing the others at the

base. *Flowers* in distinct sessile spherical heads, the *fertile* ones below in larger heads than the upper, more distant, and much more numerous, *barren* ones. *Perianth* of three spatulate pieces. *Stamens* with short *filaments*, the anthers large, yellow, two celled. *Style* short, terminal. *Stigma* one, sometimes two, awl shaped, downy on one side. *Fruit* obovate, crowned by the style, one, rarely two celled, single seeded.

Habitat.—Ditches, margins of lakes, rivers, and pools; frequent. Perennial; flowering in July.

2. *S. simplex*, *Huds.* (Fig. 1381.) *Unbranched upright Bur-reed.* Leaves triangular at the base, their sides flat; common flower stalk simple; stigma linear.

English Botany, t. 745.—English Flora, vol. iv. p. 75.—Hooker, British Flora, ed. 4. vol. i. p. 330.—Lindley, Synopsis, p. 247.

Root with long branched fibres. *Stem* erect, angular, from one to two feet high, slender, leafy, simple. *Leaves* linear, flat, sheathing at the base, quite smooth, like the rest of the plant, striated, pale green. *Flowers* in spherical heads, sessile, or one or more elevated on short peduncles, the lower *fertile* heads larger than the barren ones, the *perianth* of three oblong spatulate membranous pieces, torn on the edges. *Style* awl-shaped, downy on one side, sometimes there are two styles, *barren* flowers in smaller heads, the *stamens* with long slender *filaments*, the *anthers* linear, wedge-shaped, two celled, yellow. *Fruit* linear, obovate, crowned by the style, mostly single seeded.

Habitat.—Ditches and stagnant waters, especially in a sandy soil; less frequent than the last.

Perennial; flowering in July.

3. *S. natans*, *Linn.* (Fig. 1382.) *Floating Bur-reed.* Leaves very long, linear, plane, floating; common flower stalk simple; stigma ovate, very short; head of sterile flowers mostly solitary.

English Botany, t. 273.—English Flora, vol. iv. p. 75.—Hooker, British Flora, ed. 4. vol. i. p. 330.—Lindley, Synopsis, p. 248.

Root whorls of long fibres. *Stem* slender, long, simple, leafy. *Leaves* very long, linear, thin, almost pellucid, flat, sheathing at the base, striated, pale green. *Flowers* in spherical heads, sessile, or the lower ones on short peduncles, with leafy bracteas, the *fertile* flowers with the perianth of three ligulate membranous pieces. *Style* short, thick, with an obliquely peltate *stigma*, the *barren* flowers in a terminal head, the *stamens* with slender long *filaments*, and yellow two celled *anthers*. *Fruit* obovate, crowned by the style.

Habitat.—Lakes, ditches, and stagnant pools; abundant in the North, less frequent in the South.

Perennial; flowering in July.

The Bur-reeds are abundant plants in the marshy districts, but

they have not been applied to any other use than for packing of goods, for which purpose they are well suited, from their smoothness and pliability.

GENUS VI. TY'PHA.—LINN. *Cat's-tail, or Reed mace.*

Nat. Ord. TYPHACEÆ. JUSS.

GEN. CHAR. *Flowers* in dense cylindrical naked spikes or catkins. *Barren flowers* without perianth. *Stamens* three, united at the base into a single filament, *fertile flowers* without perianth. *Fruit* single seeded, pedicellated, the pedicles surrounded at the base with long pappus, like hairs.—Name from *τυφός*, a *marsh*; from the situation in which they grow.

1. *T. latifolia*, Linn. (Fig. 1383.) *Great Reed mace.* Leaves linear, nearly plane; barren and fertile spikes continuous.

English Botany, t. 1455.—English Flora, vol. iv. p. 71.—Hooker, British Flora, ed. 4. vol. i. p. 329.—Lindley, Synopsis, p. 247.

Root stout, creeping, with long fibrous branches, the whole plant smooth. *Stem* erect, about six feet high, round, straight, and simple, leafy, especially below. *Leaves* very long, linear, plane, often an inch broad, though usually not so much as that, sheathing at the base, with thin membranous margins, finely striated, the point obtuse. *Inflorescence* terminal spikes, the barren and fertile separate, but continuous, *fertile* ones below, very numerous, densely crowded, cylindrical, a dark brown, almost black, with a greenish tinge. *Style* long, capillary, swollen upwards into a stigma. *Fruit* stalked, surrounded at the base with several pappus-like hairs, *barren spike* terminal, of numerous crowded stamens, the *filament* bearing three *anthers*, frequently at the base of the spike, and also above are thin membranous *bractea*, like scales, often two inches long.

Habitat.—Borders of ponds and lakes.

Perennial; flowering in July and August.

The plants of this genus are called Reed-mace, from the spikes resembling a *mace*, the emblem of magisterial office. The pollen is very inflammable, and used for the same purposes in the manufactory of fireworks, as the pollen of the *Lycopodiums*. The leaves are used for making chair bottoms, and by coopers to put between the staves of their casks, to make them tight and waterproof.

2. *T. angustifolia*, Linn. (Fig. 1384.) *Lesser Reed-mace.* Leaves linear, grooved below; sterile and fertile spike a little distant from each other.

English Botany, t. 1456.—English Flora, vol. iv. p. 72.—Hooker, British Flora, ed. 4. vol. i. p. 330.—Lindley, Synopsis, p. 247.



1383 *Typha latifolia.*



1384 *T. angustifolia.*



1385 *T. minor.*



1387 *Carex davalliana.*



1388 *Carex pulicaris.*

In habit and general appearance this is similar to the last species, but the *stem* is more slender, and not so tall, the *leaves* much narrower, and channeled towards the base, the *spikes* are more slender, and the barren and *fertile* ones separated from each other about an inch, and the *barren* spike is usually more regularly cylindrical, and longer in proportion to the fertile one.

Habitat.—Pools and ditches; less common than the preceding. About London, and in the Eastern Counties of England; Loch of Lindore, Fife, Scotland.

Perennial; flowering in July.

8. *T. minor*, Sm. (Fig. 1885.) *Dwarf Reed-mace*. "Leaves linear, convex beneath; catkins (spikes) a little distant barren one, leafy, fertile, short, turgid, often interrupted; anthers nearly solitary; receptacle naked."

English Botany, t. 1435.—English Flora, vol. iv. p. 73.—Hooker, British Flora, ed. 4. vol. i. p. 330.—Lindley, Synopsis, p. 247.

"Much smaller than the preceding. *Stem* very slender, about a foot or foot and half high. *Leaves* about a line in breadth, channeled above, convex beneath, as tall as the stem, pale and blunt at the point, being rather more tumid that part than the other species. They are accompanied by numerous broad sheathing scales, the innermost of which are half as tall as the stems, and have been taken for leaves. The *barren* catkin (*spike*) often bears a membranous leaf or scale at the base, or at the summit. The *anthers* are short and thick, mostly solitary on each filament. *Receptacle* apparently naked. *Fertile* catkin (*spike*) short and thick, becoming tumid and oval as it ripens, frequently interrupted about the middle, its upper half is sometimes continuous with the barren catkins (spikes). *Seed* with numerous bristles at the base of its stalk."

Habitat.—"Found by Mr. Dandridge on Hounslow Heath."—*Dillenius*.

Perennial; flowering in July.

Not having seen British specimens of this plant we have given the description in the words of Sir J. E. Smith, who also remarks, "I have seen no English specimens of this very distinct species; but the older writers could not possibly mistake it, nor would Linnæus, had he ever examined the plants, have confounded it with the last."

GENUS VII. CAREX.—LINN. *Carex*, or *Sedge*.

Nat. Ord. CYPERACEÆ. JUSS.

GEN. CHAR. *Flowers* in imbricated cylindrical spikes. *Barren flowers* mostly collected in terminal spikelets, perianth wanting.

Stamens on slender filaments, mostly three, *fertile flowers* in imbricated spikelets, perianth (formed of united scales) urceolate, and forming a persistent covering to the triquetrous nut. *Styles* two or three.—Name of doubtful origin.

Sect. 1. *Spike solitary, terminating the stem.*

* *Stigmas two, spike dioecious.*

1. *C. dioica*, Linn. (Fig. 1386.) *Creeping separate-headed Carex.* Spike simple, terminal, solitary, the barren and fertile spikes on separate plants; fruit mostly ascending, ovate, acuminate, many ribbed, and rough on the margin towards the point; leaves and stem smooth; root creeping.

English Botany, t. 543.—English Flora, vol. iv. p. 77.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 284.

Root creeping, the whole plant slender, smooth. *Stem* ascending three to six inches high. *Leaves* slender, bristle-shaped, keeled, sheathed at the base, and with a thin obtuse auricle. *Spike* of barren flowers linear, the scales obtuse, brown, often jagged on the margin, *fertile flowers* in an ovate spike, its scales acutely pointed, fruit somewhat spreading, ovate, acutely pointed, the apex scarcely bifid, brown, striated, with numerous fine ribs, and roughish on the margin towards the point.

Habitat.—Spongy bogs; not uncommon.

Perennial; flowering in May and June.

2. *C. Davalliana*, Smith. (Fig. 1387.) *Prickly separate headed Carex.* Spike simple, terminal, solitary; the barren and fertile spikes on separate plants; fruit recurved, oblong lanceolate, slight, many ribbed, and rough on the margin towards the point; leaves and stem rough; root tufted, fibrous.

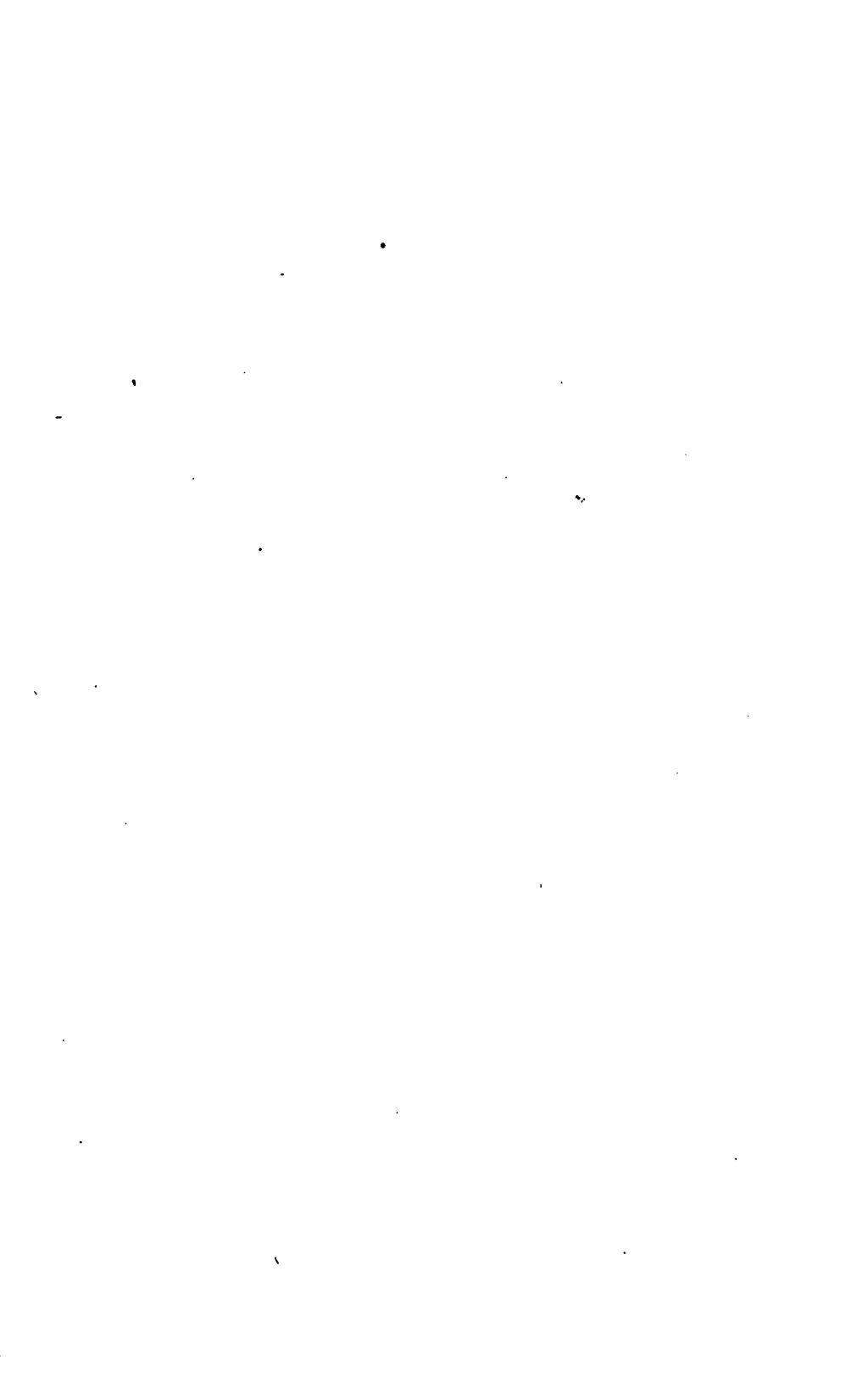
English Botany, t. 2123.—English Flora, vol. iv. p. 79.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 284.

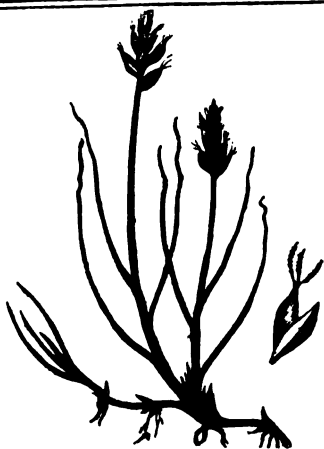
Root of numerous branched tufted fibres, the whole plant slender, roughish. *Stem* ascending, leafy, from six to twelve inches high. *Leaves* slender, bristle-shaped, sheathed at the base. *Spike* of barren flowers linear, the scales obtuse, brown, *fertile flowers* in an ovate spike, its scales acutely pointed, pale, and often jagged on the margin. *Fruit* spreading, becoming reflexed, oblong lanceolate, the beak long, slender, scarcely bifid at the apex, striated with numerous slender ribs, and rough on the margin towards the point.

Habitat.—Bogs in mountainous situations; less common than the last species.

Perennial; flowering in May and June.

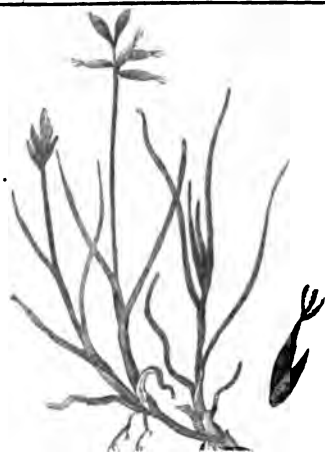
This is distinguished from the last species by its being larger, its roots fibrous, not creeping, the almost lanceolate long beaked reflexed fruit, and the whole plant is more or less rough, especially the stem.





1389

Carex rupestris.



1390

Carex pauciflora.



1391

Carex incurva.



1392

Carex divisa.



1393

Carex intermedia.



1394

Carex arenaria.

**** Stigmas two, spike with the upper florets barren.**

3. *C. pulica'ris*, Linn. (Fig. 1388.) *Flea Carex*. Spike terminal, simple, the upper half barren flowers only; stigmas two; fruit lax, oblong, tapering at each end, without ribs, becoming reflexed; scales deciduous; leaves setaceous.

English Botany, t. 1051.—English Flora, vol. iv. p. 78.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 284.

Root tufted, of numerous slender branched fibres, the whole plant slender, smooth. *Stem* erect, from six to twelve inches high, angular, striated, leafy below. *Leaves* long, bristle-shaped, keeled and striated, sheathed at the base, and with a membranous auricle. *Spike* terminal, simple, the *barren flowers* at the top with brown lanceolate scales, and a green mid-rib, the *fertile flowers* below loosely imbricated, their scales shorter, obtusely pointed, and soon falling away from the *fruit*, which is ovate lanceolate, tapering at each end, smooth, and without ribs, becoming reflexed. *Stigmas* two.

Habitat.—Bogs; frequent.

Perennial; flowering in May and June.

***** Stigmas three, spike with the upper florets barren.**

4. *C. rupe'stris*, Allion. (Fig. 1389.) *Rock Carex*. "Spike linear, with a few fertile lax flowers at the base; fruit obovate, triquetrous, rostrate, appressed, with an entire orifice, scarcely longer than the obtuse or cuspidate scale."—Hooker.

Hooker, British Flora, ed. 4. vol. i. p. 331.—Schkh. Car. n.n.n.n. f. 200.—*C. petraea*, Wahl.—Schkh. Car. k.k.k. f. 139.—*C. attenuata*, Be. in Frankl. App. p. 753.

"*Root* creeping. *Stem* three to eight inches high, rough upwards. *Leaves* flat, ending in a long attenuated, tortuous, rough, triangular point. *Barren flowers* most numerous, *fertile*, three to six, lax, lower scales sometimes acute or cuspidate."

Habitat.—"Discovered in 1836 on shelving rocks, extending from the small round lake at the top of Glen Callader, eastward to the breakneck fall."—Mr. Dickie and Mr. Templeton. Inchnadamff, Sutherland.—Mr. C. Babington.

Perennial; flowering in August.

We have not seen native specimens of this plant, and have made the drawing from a Swiss one. It is found on the Alps of Switzerland, and in the Tyrole, but is not very common.

5. *C. pauci'flora*, Lightf. (Fig. 1390.) *Few-flowered Carex*. Spike terminal, simple, of about four flowers, the upper one barren; stigmas three; fruit lanceolate, subulate, reflexed, its scales deciduous; leaves setaceous.

English Botany, t. 2041.—English Flora, vol. iv. p. 79.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 284.—*C. patula*, Hudson.—*C. leucoglossin*, Ehrh.

Root long creeping underground stems, and slender branched fibres, the whole plant smooth. *Stems* ascending from three to six inches high, slender, angular, furrowed. *Leaves* few, narrow, linear, bristle-shaped, keeled, and channeled, sheathing at the base. *Spike* of few flowers, mostly four, fertile, and a terminal solitary one. *Scales* lanceolate, pale brown or yellowish, soon falling away from the fruit, which is lanceolate, awl-shaped, smooth, without ribs, longer than the scales, becoming reflexed. *Stigmas* three.

Habitat.—Moory places; not unfrequent in the Highland Mountains of Scotland; Crag Lake, Northumberland.

Perennial; flowering in June.

Sect. 2. *Spike compound*. *Spikelets with barren and fertile flowers, in a continuous or interrupted spike.*

* *Stigmas two, spikelets with the upper florets barren.*

a. *Root creeping.*

6. *C. incurva*, Light. (Fig. 1391.) *Curved Carex*. Spikelets barren at their extremity, collected into a roundish head; stigmas two; bracteas membranous, shorter than the head; fruit broadly ovate, acuminate, the beak smooth, nearly entire at the point; stem obtusely angular, curved, smooth; leaves channeled; root creeping.

English Botany, t. 927.—English Flora, vol. iv. p. 83.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 285.

Root with long creeping underground stems and numerous long branched fibres. *Stem* smooth, angular, curved, from two to four inches long, striated, leafy at the base. *Leaves* about as long as the stem, linear, acute, smooth, a somewhat glaucous green, channeled, striated, dilated, and sheathing at the base. *Spike* terminal, ovate, densely crowded, brown. *Spikelets* several having the upper florets barren, the lower fertile, scale palish brown, the barren ones ovate lanceolate, the fertile ones ovate, acute. *Fruit* smooth, broadly ovate, acuminate, inflated, the beak nearly entire at the point. *Stigmas* two, long. *Bracteas* short, membranous, not so long as the spikelets.

Habitat.—Sandy sea shores; North of Scotland.

Perennial; flowering in June.

7. *C. divisa*, Huds. (Fig. 1392.) *Bracteated Marsh Carex*. Spikelets barren at the extremity, collected into an oblong head; stigmas two; lower bractea leafy, erect; fruit ovate, striated more numerous on the convex back than the nearly flat front, its beak acute, bifid, rough on the margins; scales as long as the fruit, the mid-rib terminating in a bristle point; root creeping.

English Botany, t. 1096.—English Flora, vol. iv. p. 87.—Hooker, British Flora, ed. 4. vol. i. p. 333.—Lindley, Synopsis, p. 286.

Root with stout widely creeping underground stems and long branched fibres. *Stem* erect, about a foot high, somewhat slender, rough above, angular, leafy, scaly at the base. *Leaves* narrow, erect,

a bright green, sheathing at the base, smooth. *Spike* terminal, ovate, about an inch long, sometimes interrupted, a dark reddish brown, the lower *bractea* leafy, and longer than the spike. *Spikelets* several having the upper florets barren, the fertile ones most numerous. *Scales* of the barren florets lanceolate, taper pointed, those of the barren ones oblong, acutely pointed, all with the green mid-rib terminating in a bristly point. *Fruit* ovate, convex at the back, and mostly many ribbed towards the point, plane, or somewhat concave in front, and mostly seven ribbed, the beak bifid, rough on the margins, not longer than the scales. *Stigmas* two, long, spreading.

Habitat.—Marshy places principally near the sea; most abundant in the East of England; Angusshire, Scotland.

Perennial; flowering in May and June.

8. *C. intermedia*, Gooden. (Fig. 1393.) *Soft brown Carex*. Spike oblong, crowded, interrupted, the lower and terminal spikelets fertile, the rest barren; fruit ovate, ribbed, with a narrow acute rough margin, its beak long, acuminate, bifid, longer than the ovate acute scales; bracteas membranous, the lower ones somewhat leafy; stem triangular; leaves plane; root creeping.

English Botany, t 2042.—English Flora, vol. iv. p. 86.—Hooker, British Flora, ed. 4. vol. i. p. 333.—Lindley, Synopsis, p. 286.—*C. disticha*, Huds.

Root with long creeping underground stems, and long deep branched fibres. *Stem* erect, from one to two feet high, unequally triangular, striated and rough on the margins, leafy below, naked above. *Leaves* a bright green, linear, with a long tapering point, flat, sheathing at the base, finely striated, rough on the edges and keel. *Spike* terminal, oblong, somewhat interrupted. *Spikelets* ovate, the upper and lower ones fertile, the intermediate ones barren. *Bracteas* membranous, or the lower ones mostly somewhat leafy. *Scales* ovate, acute, pale brown, with a green keel. *Fruit* large, ovate, longer than the scales, convex at the back, nearly plane in front, the angles acute, roughish, striated, the beak flattened and bifid at the apex. *Stigmas* two.

Habitat.—Marshy and wet meadows.

Perennial; flowering in May and June.

9. *C. arena'ria*, Linn. (Fig. 1394.) *Sea Carex*. Spike oblong, crowded, interrupted; the lower spikelets fertile, the upper barren; fruit ovate, ribbed, with a winged membranous margin, the beak short, bifid, shorter than the lanceolate scales; bracteas membranous, the lower ones somewhat leafy; stem triangular; leaves plane; root creeping.

English Botany, t. 928.—English Flora, vol. iv. p. 85.—Hooker, British Flora, ed. 4. vol. i. p. 333.—Lindley, Synopsis, p. 285.

Root with very long creeping underground stems and long branched

fibres. *Stem* erect, from six to eight inches high, unequally triangular and rough, naked above, leafy below, and sheathed with membranous scales at the base. *Leaves* several, a somewhat glaucous green, linear, tapering towards the point, rough on the margin and keel, sheathing at the base. *Spike* terminal, oblong, interrupted. *Spikelets* ovate, the lower ones fertile, the upper barren. *Bractees* membranous, the lower ones sometimes leafy, and longer than the spikelets. *Scales* shining brown, somewhat pale, lanceolate, acute, with a green keel. *Fruit* ovate, convex at the back, plane in front, striated, the margins from below the middle, with a narrow membranous wing, somewhat rough on the edge, the beak short, bifid. *Stigmas* two.

Habitat.—Sandy sea shores; frequent.

Perennial; flowering in June.

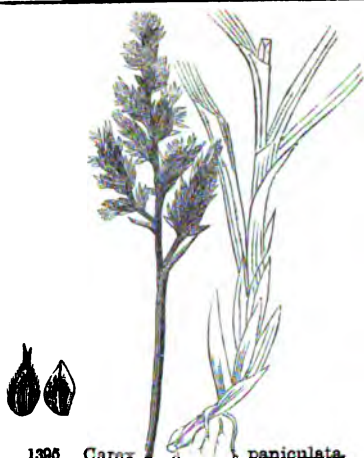
This is readily distinguished from the last species by the shape of the spike in *C. intermedia*, from the upper and lower spikelets being fertile, and the intermediate ones barren. It gives a remarkable form to it, from the lower and upper ones enlarging with the fruit, and the others diminishing after the stamens have shed their pollen; but in *C. arenaria* the lower spikelets only being fertile, and the upper barren, give an entirely different character to the appearance of the spike. This, together with the winged margins of the fruit, renders the distinction abundantly obvious. *C. arenaria* is one of the very useful plants growing among the sand on sea shores. Its long creeping underground stems and deep spreading branched fibres assist in binding together the loose sand, so as to form a firm bank against the encroaches of the sea. See vol. 1. p. 149.

b. *Roots fibrous.*

10. *C. paniculata*, Linn. (Fig. 1395.) *Great panicled Carex*. Spike panicled; spikelets ovate, arranged on lateral branches, crowded or interrupted; stigmas two; fruit sub-ovate, gibbous, many ribbed; beak acuminate, the apex bifid, the margin with a narrow toothed wing; scales ovate, acute, as long as the fruit; bractea membranous; stem triangular, rough; root tufted, fibrous.

English Botany, t. 1064.—English Flora, vol. iv. p. 92.—Hooker, British Flora, ed. 4. vol. i. p. 334.—Lindley, Synopsis, p. 286.

Root tufted, with densely crowded branched fibres. *Stem* stout, angular, rough, from two to three feet high, leafy below, naked above, striated. *Leaves* somewhat glaucous, linear, taper pointed, striated, rough on the margin and keel, and with a long sheath at the base. *Spike* terminal, two to four inches long, paniculated, the lower spikelets arranged on lateral spreading branches, of greater or less length, and are crowded or interrupted. *Spikelets* ovate, a pale shining brown. *Bractea* lanceolate, membranous, the lower ones often leafy. *Scales* ovate, somewhat acutely pointed, pale on the



1395 Carex paniculata.



1396 Carex teretiuscula.



1397 Carex vulpina.



1398 Carex divulsa.



1399 Carex muricata.



1400 Carex stellulata.



margin, the mid-rib green, roughish. *Fruit* sub-ovate, broad and obtuse at the base, with many ribs on both sides, smooth, the back convex, the front plane, or somewhat concave, the margin sub-membranous, finely serrated, the beak deeply bifid. *Stigmas* two, sessile.

Habitat.—Wet pastures and spongy bogs.

Perennial; flowering in June.

11. *C. teretiuscula*, Gooden. (Fig. 1396) *Lesser panioled Carex*. Spike compound, oblong; spikelets ovate, crowded or interrupted; stigmas two; fruit sub-ovate, convex, and marked with three or four central ribs at the back, the beak bifid, acuminate, with narrow toothed membranous margins; scales ovate, acute, as long as the fruit; bractees membranous, ovate; stem triangular, rough above; root somewhat creeping.

English Botany, t. 1065.—English Flora, vol. iv. p. 91.—Hooker, British Flora, ed. 4. vol. i. p. 334.—Lindley, Synopsis, p. 286.

Root slightly creeping, with long branched fibres. *Stem* erect, one to two feet high, slender, triangular, the edges rough, and the interstices striated, convex, leafy. *Leaves* linear, narrow, as long or longer than the stem, dark green, striated, the margins and keel rough. *Spike* terminal, compound, oblong, continuous or interrupted, one to two inches long. *Spikelets* ovate, the terminal florets barren. *Scales* ovate, acute, with a green mid-rib. *Bractees* membranous, the lower ones are sometimes leafy, but short. *Fruit* brown, ovate, convex at the back, tumid, and marked with three or four ribs in the centre, tapering upwards into a narrow beak, rough on the margin, with a narrow membranous edge, the apex bifid. *Stigmas* two.

Habitat.—Boggy places; but not very common.

Perennial; flowering in May and June.

This is a much smaller plant than the last species, and grows less tufted; its leaves are narrow, and as long, or nearly so, as the stem, and of a more glaucous hue.

12. *C. vulpi'na*, Linn. (Fig. 1397.) *Great Carex*. Spike compound, ovate oblong, dense, or interrupted; spikelets with the upper florets barren; stigmas two; fruit ovate-acuminate, plano-convex; beak bifid, the margins rough, acute, five to seven ribbed, spreading; scales bristle pointed, shorter than the fruit; stem acutely triangular, rough; root fibrous.

English Botany, t. 307.—English Flora, vol. iv. p. 90.—Hooker, British Flora, ed. 4. vol. i. p. 334.—Lindley, Synopsis p. 286.

Root with long branched fibres, tufted. *Stem* erect, from two to three feet high, leafy below, naked above, acutely triangular, the edges rough and sharp, the interstices concave, striated, smooth. *Leaves* a dark glaucous green, sheathed at the base, and auricled, with

a thin pale membrane, broadly linear, as long or often longer than the stem, the edges and keel very sharp, and finely serrated. *Spike* terminal, large, compound, oblong, cylindrical, or interrupted, densely crowded, from two to three inches long. *Spikelets* ovate, dense, the upper florets barren. *Scales* ovate, bristle pointed, the mid-rib green, rough, the scales of the barren florets more lanceolate, shorter than the fruit. *Bractees* membranous, the lower ones often terminating in a slender angular leafy point. *Fruit* ovate, acuminate, spreading on all sides, brown, shining, acutely angular, plano-convex, five to seven ribbed, the angles acute, rough, tapering into a beak, bifid at the point. *Stigmas* two.

Habitat.—Boggy places, the margin of pools and rivers.

Perennial; flowering in May.

The large tufts formed by these plants in boggy places are extremely useful as forming clumps of mould, which gradually accumulates; the carex at length giving place to other less rigid plants more suited for fodder. The sharp saw-like edges of these plants require cautious handling, otherwise every angle will cut through the skin, and cause wounds troublesome to heal.

13. *C. divulsa*, Gooden. (Fig. 1398.) *Grey Carex*. Spike compound, lax; spikelets five or six, the lower ones remote; stigmas two; fruit ovate, plano-convex, acuminate, without ribs, the margins scarcely rough, erect; scales ovate, acute, mucronate; stem slender, angular, rough above; root fibrous.

English Botany, t. 629.—English Flora, vol. iv. p. 89.—Hooker, British Flora, ed. 4. vol. i. p. 334.—Lindley, Synopsis, p. 286.

Root tufted, with numerous long branched fibres. *Stem* erect, slender, acutely triangular, rough on the edges above, smooth and leafy below, and like the leaves a bright green. *Leaves* narrow, linear, sheathed at the base, as long or longer than the stem, rough on the edges and keel. *Spike* terminal, oblong, lax, of about six rather loose *spikelets*, the lower ones remote from the upper, and mostly compound. *Scales* ovate, acute, with a bristle point, pale, membranous, the mid-rib green. *Fruit* broadly ovate, smooth, shining green, convex at the back, and without ribs, or obscurely ribbed at the base, flat or concave above, tapering into a bifid beak, the angles smooth, or scarcely rough, erect, or somewhat spreading when ripe. *Bractees* ovate, membranous, the lower ones sometimes with a slender leafy point. *Stigmas* two.

Habitat.—Moist shady places.

Perennial; flowering in May.

14. *C. muricata*, Linn. (Fig. 1399.) *Greater prickly Carex*. Spike compound, oblong, dense or interrupted below; spikelets about six, brownish; stigmas two; fruit ovate, plano-convex, acuminate, spread-

ing, with acute rough margins; scales ovate, acute, mucronate; stem angular, rough above; root fibrous.

English Botany, t. 1097.—English Flora, vol. iv. p. 88.—Hooker, British Flora, ed. 4 vol. i. p. 834.—Lindley, Synopsis, p. 286.

Root tufted, with numerous branched fibres. *Stem* erect, from one to two feet high, slender, angular, the angles above rough, striated, leafy below, bright green, like the narrow linear *leaves*, about as high as the stem, sheathed at the base, the margins and keel rough, with fine teeth. *Spike* terminal, oblong, obtuse, one to two inches long, brown, densely crowded or interrupted below. *Bractea* ovate, membranous, the lower ones mostly with a leafy slender point. *Spikelets* rather lax, the upper florets barren. *Scales* ovate, acute, brown, membranous, the mid-rib green, terminating in a mucro, shorter than the fruit, smooth. *Fruit* ovate, acute, smooth, green, at length brown, convex at the back, without ribs, plane, or somewhat concave in front, the angles smooth below, rough above, the beak short, bifid. *Stigmas* two. The fruit is more or less spreading, and gives a prickly appearance to the spike.

Habitat.—Moist pastures and shady places, especially in a sandy soil.

Perennial; flowering in May and June.

15. *C. paradoxa*, Willd. "Spikes narrowly panicled; lower branches rather distant; fruit ovate, gibbous, with numerous short elevated ribs near its base; beak bi-dentate, serrulate, with no wing on its convex side; nut rhomboidal, constricted below, convex on both sides, without a beak; style slightly enlarged at the base; stem trigonous and scabrous in the upper part, with convex faces."

Babington, British Botany, p. 337.

Specimens of this species we have not seen. It grows in boggy places in dense tufts, and has a slender stem, from one to two feet high.

Habitat.—In a boggy wood at Ladiston, near Mullingar, Ireland.—*Mr. D. Moore*.

Perennial; flowering in July.

** *Stigmas* two. *Spikelets* with the lower florets barren.

16. *C. boenninghausiana*, Weihe. *Boenninghausian Carex*. Spike compound; spikelets several, alternate, oblong lanceolate, the upper crowded, fertile, the lower distant, barren; stigmas two; fruit lanceolate, plano-convex, tapering into an almost entire beak, strongly serrated from below the middle; scales equalling the fruit; root tufted.

Babington, British Botany, p. 337.

Root much tufted. *Stem* slender, from one to two feet high, tri-angular, rough on the edges. *Spike* compound, sub-distichous above, spikelets from eight to twelve, the lower ones with alternate spiculæ.

Scales ovate, membranous, of a silvery brown colour, with a faint mid-rib terminating below the point. *Bracteas* short, except the lower ones, which are narrow, leafy, and as long or longer than the spike. *Leaves* narrow, channeled. *Fruit* as long as the glume, erect, lanceolate, smooth, plano-convex, the beak tapering, attenuated, serrated on the margin from below the middle bifid. *Stigmas* two.

Habitat.—Near Hereford.—*Rev. W. H. Coleman*.

Perennial; flowering in June.

This species is distinguished from *C. remota* and *C. axillaris*, by the habit of the plant, and its fruit being more tapering and equalling the scales.

17. *C. stellulata*, Gooden. (Fig. 1400.) *Little prickly Carex*. Spike compound; spikelets about four, remote, roundish, barren at the base; stigmas two; fruit ovate, with a long slender beak, bifid, rough on the margins, striated, spreading, longer than the ovate acute scales; stem smooth; root fibrous.

English Botany, t. 806.—English Flora, vol. iv. p. 80.—Hooker, British Flora, ed. 4. vol. i. p. 331.—Lindley, Synopsis, p. 284.

Root tufted, with long tough fibres. *Stem* erect, from six to twelve inches high, slender, triangular, nearly smooth, leafy and scaly at the base. *Leaves* narrow, linear, flat, tapering, and rough towards the point, sheathed at the base, about as long as the stem. *Spike* terminal, lax, of about four roundish *spikelets*, of crowded florets, the lower ones barren. *Bracteas* membranous, ovate, the lower ones sometimes with a slender leafy point. *Scales* pale, membranous, ovate, acute, with a green mid-rib terminating below the point. *Fruit* ovate, brown, smooth, convex at the back, and striated, flat or concave in front, the beak long, tapering, with a narrow green membranous rough margin, the apex scarcely bifid. *Stigmas* two.

Habitat.—Marshes and heathy places.

Perennial; flowering in May and June.

18. *C. leporina*, Linn. (Fig. 1401.) *Hare's-foot Carex*. "Spikelets three, rarely four, ovate, contiguous; fruit elliptic, rostrate, plano-convex, smooth, nerved, with a scarioso bi-dentate finally entire orifice, scarcely longer than the ovate obtuse scales, which are scarioso at the margins."

Hooker, British Flora, ed. 4. v. i. p. 332. Schkh.—F.F.F.F. f. 129.—*C. Lachenalii*.—Schkh. y. f. 79.—*C. lagopina*, Wahl.—*C. approximata*, Hoppe. Gand. (*not allion*).—*C. parviflora*, Gand. (*not Host.*)

"*Root* fibrous. *Stem* four to eight inches high, smooth, rarely rough below the spike. *Leaves* a line broad, shorter than the stem. *Spikelets* brown. *Bracteas* broad, ovate, obtuse, the lowest aristate, rarely foliaceous, and larger than the spikelets. *Seeds* elliptic, plano-convex, pale yellow."—*Boott*.





1401

Carex leporina.



1402

Carex ovalis.



1403

Carex remota.



1404

Carex axillaris.



1405

Carex curta.



1406

Carex elongata.

Habitat.—Rocks on the west side of Loch-na-gar, Scotland, August, 1836.—*Mr. Dickie*.

Perennial; flowering in July.

Native specimens of this plant we have not seen. It is nearly related to the following, from which it is not considered distinct by some of the Continental Botanists. The above description we have taken from Hooker.

19. *C. ovalis*, Gooden. (Fig. 1402.) *Oval-spiked Carex*. Spike compound; spikelets about six, alternate, ovate, approximate, barren at the base; stigmas two; fruit ovate, plano-convex, acuminate into a bifid beak, striated with a roughish membranous margin, erect, longer than the lanceolate scales; stem smooth; root fibrous.

English Botany, t. 306.—English Flora, vol. iv. p. 82.—Hooker, British Flora, ed. 4. vol. i. p. 332.—Lindley, Synopsis, p. 286.

Root fibrous, tufted, somewhat creeping. *Stem* erect, from one to two feet high, angular, smooth below, scarcely rough above, leafy below. *Leaves* linear, tapering, smooth, striated, shorter than the stem, sheathing at the base, and with a short membranous ligule. *Spike* terminal, oblong, of about six, ovate, alternate, smooth, shining, pale brown. *Spikelets* a little separate from each other. *Bracteas* ovate lanceolate, membranous, the lower ones rarely leafy, or longer than the spikelets. *Scales* pale brown, membranous, with a green mid-rib, lanceolate, rather shorter than the fruit, smooth. *Fruit* ovate, with an acuminate beak, more or less numerously striated, convex at the back, flat or concave in front, the margins with a thin membranous rather broad margin, smooth or roughish towards the bifid beak. *Stigmas* two.

Habitat.—Bogs and marshy places.

Perennial; flowering in June.

20. *C. remota*, Linn. (Fig. 1403.) *Distant spiked Carex*. Spike compound; spikelets alternate, solitary, remote, barren at the base, small; stigmas two; fruit ovate, plano-compressed, acuminate into a rough bifid beak, longer than the ovate acute scales; bracteas very long, narrow, leafy; stem slender, smooth, not fibrous, tufted.

English Botany, t. 832.—English Flora, vol. iv. p. 84.—Hooker, British Flora, ed. 4. vol. i. p. 332.—Lindley, Synopsis, p. 285.—*C. tenella*, Schkh.—English Flora, vol. iv. p. 83.

Root tufted, with numerous fibrous branches, whole plant pale green. *Stem* angular, slender, roughish above, leafy, from one to two feet high, often drooping. *Leaves* narrow, linear, rough on the margins and keel, sheathing at the base. *Spike* terminal, compound, of alternate sessile *spikelets*, small, pale green, the lower florets barren, the lower spikelets distant in the axis, of long leafy bracteas, the upper ones nearer, with short scaly bracteas. *Scales* pale green,

ovate, with a green mid-rib terminating below the point, and shorter than the fruit, smooth. *Fruit* ovate, acuminate, somewhat compressed, striated with a bifid apex, the margins rough, with serrated teeth, pale green. *Stigmas* two.

Habitat.—Woods and shady places.

Perennial; flowering in June.

21. *C. axilla'ris*, Gooden. (Fig. 1404.) *axillary clustered Carex*. Spike compound; spikelets alternate, the lower ones remote, often three or four together in the axis of long leafy bractea, the upper solitary, with short bractea; stigmas two; fruit ovate, plano-compressed, acuminate into a rough bifid beak, longer than the rough ribbed scales; stem erect; root fibrous.

English Botany, t. 993.—English Flora, vol. iv. p. 84.—Hooker, British Flora, ed. 4. vol. i. p. 333.—Lindley, Synopsis, p. 285.

Root tufted, fibrous. *Stem* erect, about two feet high, rather stout, angular, striated, rough, naked above, leafy below, leaves linear, long, striated, with a slender tapering point, rough on the margins, sheathed at the base. *Spike* terminal, compound. *Spikelets* small, ovate, the lower ones three or four, crowded together in the axis of the long leafy bractea, the upper ones solitary, with a short bristle shaped bractea. *Scales* ovate lanceolate, pale, membranous, with two parallel green rough mid-ribs, terminating in the point, shorter than the fruit. *Fruit* ovate, green, 'plano-compressed, acuminate into a bifid beak, the margin rough, with five serrated teeth. *Stigmas* two.

Habitat.—Marshes; rare. Putney, near London; Earsham, Norfolk; Over, Cheshire; Killin, and near Crichton Castle, Edinburgh, Scotland.

Perennial; flowering in June.

This is nearly allied to the last species, but it is a stouter, rougher plant, rarely without there being several spikelets crowded together in the axis of the lower bractea, and the scales are more rigid, from the two rough ribs at the back terminating in a point.

22. *C. curta*, Gooden. (Fig. 1405.) *White Carex*. Spike compound; spikelets about six, rather distant, sub-ovate; bractea very minute, except the lower one; stigmas two; fruit rather longer than the scale, ovate, acute, plane above, convex at the back, slightly striated; beak short, entire, the margins rough; stem smooth below, rough above.

English Botany, t. 1386.—English Flora, vol. iv. p. 81.—Hooker, British Flora, ed. 4. vol. i. p. 332.—Lindley, Synopsis, p. 285.—*C. canescens*, Light.—*C. brizoides*, Huds.

Root slightly creeping. *Stem* erect, about a foot high, angular, leafy and smooth below, naked and roughish above, striated. *Leaves* narrow, erect, linear, with a long tapering point, striated, sheathing at the base, rough on the edges and keel. *Spike* terminal, compound, of

about six ovate tumid neat looking *spikelets*, the lower ones rather distant, of a pale silvery grey hue. *Bracteas* small, except the lower one, which is sometimes lanceolate. *Scales* ovate, acute, pale, thin, membranous, rather shorter than the fruit, with a slender mid-rib. *Fruit* ovate, acute, somewhat tumid, smooth, with a short entire beak, the angles obtuse, rather rough, all imbricated one over the other in a very regular manner. *Stigmas* two.

Habitat.—Bogs in several parts of England; not common.

Perennial; flowering in May and June.

The pale neat ovate imbricated spikelets tumid, with small bracteas, and the ovate almost elliptical entire pointed fruit, readily distinguish this species.

23. *C. elongata*, Linn. (Fig. 1406.) *elongated Carex*. Spike compound; spikelets oblong, rather distant, numerous; bracteas minute; stigmas two; fruit patent, lanceolate, compressed, convex at the back, numerously striated; beak attenuated, scarcely bifid, the margins rough, somewhat recurved, longer than the ovate acute scales; stem erect, angular, rough, shorter than the leaves.

English Botany, t. 1920.—English Flora, vol. iv. p. 82.—Hooker, British Flora, ed. 4. vol. i. p. 332.—Lindley, Synopsis, p. 285.

Root tufted, with long fibres. *Stem* erect, from twelve to eighteen inches high, angular, striated, rough, especially above, leafy below, naked above. *Leaves* linear, striated, roughish on the margin and keel, sheathed at the base, as long or longer than the stem. *Spike* terminal, compound. *Spikelets* oblong, numerous, brownish green, rather distant. *Bracteas* small, ovate, membranous, bristle pointed. *Scales* membranous, ovate, acute, with a green mid-rib, terminating below the point. *Fruit* somewhat spreading, lanceolate, brownish green, numerously striated, the beak somewhat recurved, the apex slightly bifid, and the margin rough, almost as long again as the scales. *Stigmas* two.

Habitat.—Marshes, rare. Aldwark, near Sheffield, Yorkshire; Pit side at Over, Cheshire; Shropshire.

Perennial; flowering in June.

This rare species of *Carex* was discovered as a native plant by Mr. Jonathan Salt, a Sheffield Botanist, who, from the midst of the busy scenes of the merchant's counting-house, found time to pursue in the midst of the surrounding fields and woods and moors his favourite recreation; and few persons have left behind them a more valuable token of perseverance and industry, united with an ardent zeal and accuracy of observation than he has done in the excellent collection of native plants which now are deposited in the Museum of the Sheffield Literary and Philosophical Society. His early morning hours and evening's leisure, apart from business, were spent in investigating the works of nature, and when by necessity separated

from his favourite studies, he indulged in a mood of feeling, which the poet seems to have interpreted in these lines—

“ — O ye Fountains, Meadows, Hills, and Groves,
 Think not of any severing of our loves!
 Yet in my heart of hearts I feel your might;
 I only have relinquished one delight,
 To live beneath your more habitual sway.
 I love the brooks which down their channels fret,
 Even more than when I tripped lightly as they;
 The innocent brightness of a new-born day
 Is lovely yet;
 The clouds that gather round the setting sun
 Do take a sober colouring from an eye
 That hath kept watch o'er man's mortality;
 Another race hath been, and other palms are won.
 Thanks to the human heart by which we live,
 Thanks to its tenderness, its joys and fears,
 To me the meanest flowers that blows can give
 Thoughts that do often lie too deep for tears.”

Wordsworth.

Sect. 3. *Terminal spikelet with barren and fertile flowers, the rest fertile. Stigmas three.*

24. *O. Vahl'tii, Schkh.* (Fig. 1407.) *Close-headed alpine Carex.* Spike compound; spikelets three or four, roundish oblong, the terminal one with barren flowers at its base; stigmas three; fruit obovate, scabrous above, with minute crystalline prickles, shortly beaked, longer than the ovate obtuse scales; stem triangular, rough; root creeping.

English Botany, Suppl. t. 2666.—Hooker, British Flora, ed. 4. vol. i. p. 335.—Lindley, Synopsis, p. 333.

Root tufted, and somewhat creeping. *Stem* erect, from six to twelve inches high, rigid, triangular, and rough on the edges, especially above, leafy below. *Leaves* narrow, linear, tapering to an acute point, flattish, the edges rough, sheathing at the base. *Spike* terminal, of three or four roundish or oblong *spikelets*, the lowest on a short footstalk, the rest sessile, the terminal spikelets only with barren flowers, which are mostly at the base. *Bractea* of the lower spikelet leafy, rising above the spike. *Scales* of the fertile flowers dark brown, almost black, broadly ovate, acute, those of the barren flowers paler, and more lanceolate. *Fruit* obovate, longer than the scales, green, or somewhat tawny, the beak short, bifid, rough, as well as the upper part of the angles, with small crystalline prickles. *Stigma*, three.

Habitat.—Alpine rock, Scotland, Head of Loch Callater, in Bræmar; Glen on the south side of Glen Dole; about six miles from Castleton.

Perennial; flowering in August and September.



1407

Carex vahlII.



1408

Carex buxbaumii.



1409

Carex atrata.



1410

Carex caespitosa.



1411

Carex rigida.



1412

Carex aquatilis.



25. *C. Buxbaum'ii*, Wahl. (Fig. 1408.) (*hoary Carex*). "Spikelets three to five, terminal one barren at the base, fertile, sessile, except the lowest, which is on a short stalk, and sub-remote; fruit oblong, oval, obtuse, triquetrous, nerved, bi-dentate, pellucidly asperate, shorter than the ovate cuspidate scales."

Hooker, British Flora, ed. 4. vol. i. p. 335.—*C. polygama*, Schkh. X. G. g. f. 76.—*C. canescens*, Linn.

"Root creeping. Stem one to two feet high, erect, acutely triangular, rough, leafy at the base, and clothed with purple sheaths, which are torn and reticulated at their edges. Leaves straight, shorter than the stem, middle spikes smallest, more or less approximate. Bracteas rough, auriculated, but without sheaths, the lowest sometimes longer than the stem, upper ones setaceous. Fruit glaucous, green, stained with brown, shorter at the base of the spikelets than the cuspidate scales, which are brown, with a pale green nerve."

Habitat.—On a rocky island in Lough Neagh, Ireland.—*Mr. Moore*.

Perennial; flowering in July.

"Linnaeus confounded *C. alpina*, Vahl. (*C. VahlII*, Schkh.) and *C. curta*, Gooden. with this species. The specimens from Lapland are of the present plant. *C. curta* was described by the late Bishop of Carlisle, in the Linn. Trans. v. 2. p. 145, in 1792, eleven years before Wahlenberg; in Act. Holm. (1803) described the present species under the name of *C. Buxbaumii*. The original name of *C. canescens* must be restored to it. Boott. in Hooker, British Flora, ed. 4. vol. i. p. 335."

We have given the above description from Hooker, rather than describe foreign specimens, with which we are only acquainted, though they do not in any respect differ from the above description.

26. *C. atra'ta*, Linn. (Fig. 1409.) *Black Carex*. Spike compound; spikelets three to five, ovate, pedunculated, the terminal one erect, barren at the base, the others fertile, drooping; lower bractea leafy; stigmas three; fruit roundish ovate, compressed, with a short scarcely bifid beak, as long as the dark ovate acute scales; stem smooth; root tufted.

English Botany, t. 2044.—English Flora, vol. iv. p. 103.—Hooker, British Flora, ed. 4. vol. i. p. 335.—Lindley, Synopsis p. 289.

Root tufted, with strong fibres and somewhat creeping stems. Stem erect, about a foot high, triangular, smooth, striated, leafy below. Leaves linear, with a long tapering point, striated, rough, sheathing at the base. Bractea of the lower spikelets leafy, scarcely sheathed at the base with two auricular appendages. Spikelets three to five, broadly ovate, the terminal one erect, with barren flowers at the base, the others fertile and pedunculated, and drooping. Scales dark brown, almost black, those of the fertile flowers ovate, acute, of

the barren more lanceolate, all with a greenish mid-rib, terminating in a point. *Fruit* roundish ovate, compressed, with a short slightly bifid beak, smooth, pale green, or tawny. *Stigmas* three.

Habitat.—Alpine rocks and pastures, in Wales and Scotland.

Perennial ; flowering in June.

Sect. 4. *Terminal spikelet barren, solitary, (rarely more than one), the rest fertile.*

* *Stigmas two.*

27. *C. caespitosa*, Linn. (Fig. 1410.) *tufted Bog Carex*. Barren spike mostly solitary, fertile ones three, sessile, the lower one rarely pedunculated ; bracteas leafy, without sheath, but auricled at the base ; stigmas two ; fruit smooth, elliptic, obtuse, with a very short entire beak, closely imbricated ; scales ovate, obtuse ; leaves linear, erect ; root creeping.

English Botany, t. 1507.—English Flora, vol. iv. p. 117.—Hooker, British Flora, ed. 4. vol. i. p. 386.—Lindley, Synopsis, p. 291.—*C. angustifolia*—English Flora, vol. iv. p. 127.—*C. Goodenovii*, Gay.—Bab. British Bot. p. 341.

Root creeping. *Stem* erect, from six to twelve inches high, angular, striated, smooth below, rough above, a pale glaucous green, as well as the *leaves*, which are erect, or somewhat spreading, rather rigid, linear, narrow, rough on the angles and keel, sheathed at the base, and enveloped in dark reddish brown sheaths. *Spike* terminal, compound, the terminal *spikelet* barren, narrow, cylindrical, solitary, rarely with one or two other small ones, the fertile ones three, rarely four, sessile, the lower one sometimes on a short peduncle. *Bracteas* leafy, without sheaths, but with a dark ovate auricular appendage at the base, the lower one long, the others shorter. *Scales* dark brown, almost black, the barren ones ovate, obtuse, the fertile ones ovate, acute. *Fruit* smooth, green or brownish, elliptic, obtuse, with a very short round entire beak, its angles obtuse, convex at the back, plane in front, longer than the scales. *Stigmas* two, nearly sessile.

Habitat.—Marshes and wet places ; frequent.

Perennial ; flowering in May and June.

28. *C. rigida*, Gooden. (Fig. 1411.) *rigid Carex*. Barren spike mostly solitary, fertile ones three, sessile, the lower one often pedunculated ; bracteas leafy, without sheath, but auricled at the base ; stigmas sessile, two ; fruit obovate, attenuated at the base, somewhat stalked, the beak a very short entire point ; scales ovate, obtuse ; leaves broadly linear, mostly recurved ; root creeping.

English Botany, t. 2047.—English Flora, vol. iv. p. 116.—Hooker, British Flora, ed. 4. vol. i. p. 386.—Lindley, Synopsis, p. 290.

This is similar to the last species, from which it differs in being more rigid, the *stem* four to six inches high, curved. The *leaves* and *bracteas* are broader, not erect, but more or less recurved. *Stigmas*

nearly or quite sessile, erect. *Fruit* similar in shape to that of *C. caespitosa*, except with a short stalk at the base.

Habitat.—Summit of the mountains of Scotland and Wales.

Perennial; flowering in June and July.

29 *C. Gibsoni*, Bab. "Barren spike one, fertile, two to four, oblong, narrowed downwards, lower shortly stalked; bracteas leafy; fruit about one-third longer than the glume, lanceolate, gradually narrowing into a very short entire beak, with many nerves vanishing upwards; nut broadly obovate, rounded at the end, and shortly beaked."

Babington, British Botany, p. 340.

"*Stem* six to eight inches high, triquetrous, with flat or concave faces, rough at the top. *Leaves* flat, slender, slightly rough on the edges and keel. *Bracteas* without sheaths, lowest often overtopping the spikes. *Spikes* lax below. *Glumes* (scales) oblong, blunt, purplish brown, with a broad green band up the mid-rib, on the barren spike paler, obovate lanceolate. *Perigone* (scale) nearly twice as long as the nut, gradually narrowing from below the middle to the top, pale green. *Nut* rather longer than broad. *Root* creeping."

Habitat.—Hebden Bridge, Yorkshire.—*Mr. S. Gibson*.

Perennial; flowering in June.

30 *C. aquatilis*, Wahl. (Fig. 1412.) *Straight-leaved Water Carex*. Barren spike mostly solitary, three or four, nearly sessile, cylindrical, elongated, attenuated below, and often acuminate, with barren flowers at the extremity; bracteas leafy, without sheaths; stigmas two; fruit roundish obovate, with a very short entire point; scales ovate, acute; stem smooth, obtusely angular; leaves long, straight, narrow, linear; sheaths not fibrous.

English Botany, t. 2758.—Hooker, British Flora, ed. 4. vol. i. p. 336.—Lindley, Synopsis, p. 333.

Root creeping. *Stem* erect, from one to two feet high, obtusely angular, smooth below, roughish above, finely striated, leafy below, and enveloped in numerous old sheaths. *Leaves* long, linear, narrow, erect, with a narrow tapering point, a glaucous green, rough on the margins and keel. *Bracteas* long, leafy, erect, without sheaths, and, scarcely auricled at the base. *Spike* terminal, compound, the terminal *spikelet* a barren one, and often accompanied with two other smaller ones, narrow, cylindrical, with oblong very obtuse dark brown scales, fertile spikelets three or four sessile, or the lower ones pedunculated, cylindrical, elongated, and often with the florets towards the base scattered, and at the top there are sometimes barren florets, scales ovate, obtuse, or somewhat acute, with a green mid-rib terminating below the apex. *Fruit* roundish obovate, smooth, pale green, with a very short entire point, longer than the scales. *Stigmas* two.

Habitat.—Table lands in boggy situations in the mountains of Clove, Scotland.

Perennial; flowering in July and August.

Dr. Boott doubts this really being the *C. aquatilis* of Wahlenberg, since that author describes his plant as having scales much narrower than the fruit, which is not the case with ours, and the place of growth and size as being so very different, "in ipsis fluviis et lacubus"—"scope altitudinem humanam attingens"—"ad radicem sapius pallicem crassa." See Hooker, British Flora, but our plant is not found off the naked table land of the mountains, and is not known to grow actually in water but boggy situations.

81. *C. acuta*, Linn. (Fig. 1413.) *Slender spiked Carex*. Barren spikelets often more than one, fertile about four, long, cylindrical, acuminate, slender, erect in fruit, often with barren flowers at the extremity; bractea long, foliaceous, without sheaths; stigmas two; fruit smooth, ovate, elliptic, sub-compressed, inflated, acuminate, with short entire point; scales lanceolate, longer than the fruit; stem acutely angular, rough; leaves broadly linear; sheaths not fibrous.

English Botany, t. 590.—English Flora, vol. iv. p. 119.—Hooker, British Flora, ed. 4. vol. i. p. 336.—Lindley, Synopsis, p. 291.

Root extensively creeping. *Stem* from two to three feet high, erect, smooth and leafy below, rough above. *Leaves* broadly linear, a bright green, somewhat drooping, rough at the edges and keel, sheathed at the base. *Spike* terminal, compound. Terminal *spikelets* barren one, two, or three, slender, linear, cylindrical, *scales* dark brown, oblong, obtuse, with a green mid-rib terminating below the apex, *fertile* spikelets three or four, the upper sessile, the lower mostly pedunculated, long, narrow, cylindrical, sometimes the terminal florets are barren, *scales* lanceolate, longer than the fruit. *Bracteas* long, leafy, without sheaths, but with a small auricular appendage on each side at the base. *Fruit* smooth, elliptic, ovate, inflated, sub-compressed, obsoletely ribbed, acuminate, with a very short entire beak. *Stigmas* two.

Habitat.—Moist meadows and pastures; frequent.

Perennial; flowering in May.

82. *C. stricta*, Gooden. (Fig. 1414.) *Straight-leaved Carex*. Barren spikelet mostly solitary, fertile about three, cylindrical, elongated, closely imbricated, erect, often acuminate, with barren flowers at the extremity, nearly sessile; bracteas short, sub-foliaceous, without sheaths, but auriculated at the base; stigmas two; fruit ovate, with a very short point, compressed, smooth, elevated on a short stalk; scales ovate lanceolate, shorter than the fruit; stem acutely angular, roughish; leaves long, straight, narrow, linear, glaucous, sheathed, and often fibrous at the base.





1413

Carex acuta.



1414 *Carex stricta.*

1415

Carex saxatilis.



1416

Carex flava.



1417

Carex extensa.



1418

Carex pallescens.

English Botany, t. 914.—English Flora, vol. iv. p. 118.—Hooker, British Flora, ed. 4. vol. i. p. 337.—Lindley, Synopsis, p. 291.—*C. caespitosa*, Linn.

Root creeping. *Stem* erect, from one to two feet high, acutely triangular, roughish at the top, smooth and leafy below. *Leaves* erect, narrow, linear, of a somewhat glaucous green, rough on the angles and keel, sheathed and fibrous at the base. *Spike* terminal, compound, the top one sometimes two, narrow, linear, cylindrical, barren, the scales oblong, ovate, obtuse, with a pale mid-rib, fertile spikelets three or four, sessile, or elevated on a short peduncle, cylindrical, crowded, imbricated, sometimes tapering towards the top with barren florets, scales lanceolate, almost black, the mid-rib green, shorter than the fruit. *Fruit* elevated on a short footstalk, ovate, compressed, smooth, green, with a very short entire beak. *Stigmas* two. *Bracteas* short, somewhat leafy, without sheaths, but with an auricular appendage on each side at the base.

Habitat.—Marshes; frequent.

Perennial; flowering in May.

33. *C. saxatilis*, Linn. (Fig. 1415.) *Sussex Carex*. Barren spikelet solitary, linear; fertile two, ovate, obtuse, the lower ones pedunculated; bracteas leafy, auriculated at the base; stigmas two; fruit spreading, elliptical, inflated, with a short bifid beak, longer than the ovate scales; stem acutely angular, rough; leaves linear, acuminate; root creeping.

C. pulla.—Lindley, Synopsis.—English Botany, t. 2045.—English Flora, vol. iv. p. 104.—Hooker, British Flora, ed. 4. vol. i. p. 337.

Root somewhat creeping, with long stout fibrous roots. *Stem* erect, about eight inches high, obtusely angular, rough above, smooth and leafy below. *Leaves* linear, striated, rough at the margins and keel, remarkably acuminate at the point, sheathed at the base. *Bracteas* without sheaths, but with an auricular appendage at the base on each side, the lower one leafy, the upper small, setaceous. *Spike* terminal, compound, the terminal spikelet cylindrical, linear, barren, with dark brown ovate acute scales, fertile spikelets two, ovate, obtuse, the upper sessile, the lower on a slender peduncle, somewhat drooping. *Scales* ovate, somewhat acute, brown, with a green mid-rib, shorter than the elliptical pale brown fruit, which is inflated, smooth, obsoletely ribbed, the beak short, bifid. *Stigmas* two.

Habitat.—Near springs on the high mountains of Scotland; rare.

Perennial; flowering in June.

** *Stigmas three*.

a. *Fruit smooth*.

1. *Fertile spikelets nearly sessile*.

34. *C. flava*, Linn. (Fig. 1416.) *Yellow Carex*. Barren spikelet

solitary, terminal; fertile two or three roundish ovate, rather distant the upper sessile, the lower one mostly pedunculated; bracteas long, leafy, with short sheaths, about as long as the peduncles; stigmas three; fruit ovate, inflated, ribbed, spreading, with a long decurved bifid beak, rough on the margins, much longer than the broadly ovate acute scales; leaves broadly linear, acuminate; root fibrous.

English Botany, t. 1294.—English Flora, vol. iv. p. 106.—Hooker, British Flora, ed. 4. vol. i. p. 337.—Lindley, Synopsis, p. 289.

β. Ederi. Fruit with a straight beak.

C. Ederi.—English Botany, t. 1773.—English Flora, vol. iv. p. 105.—Hooker, British Flora, ed. 4. vol. i. p. 338.—Lindley, Synopsis, p. 289.

Root of long tufted branched fibres. *Stem* erect, six to eight inches high, angular, smooth, naked above, leafy below. *Leaves* broadly linear, with an acuminate point as long as the stem, striated, flat, rough on the margin and keel, sheathed at the base. *Bracteas* long, leafy, with short sheaths, spreading. *Spike* terminal, compound. *Barren* spikelet linear, stalked, terminal, with narrow lanceolate brown scales, *fertile* spikelets three, sometimes four, the upper sessile, and near to each other, the lower one more distant, and elevated on a short peduncle, not longer than the sheath of the bracteas. *Fruit* smooth, spreading, broadly ovate, inflated, with a long acuminate beak, bifid at the point, distinctly ribbed, and somewhat rough on the edges, the beak is more or less recurved, and more than half as long as the fruit. *Stigmas* three. *Scales* broadly ovate, acute, with a green rib shorter than the fruit.

Habitat.—Wet boggy meadows; frequent.

Perennial; flowering in May and June.

35. *C. exten'sa*, Gooden. (Fig. 1417.) *long bracteated Carex*. Barren spikelet solitary, terminal; fertile two or three, nearly sessile, oblong, ovate, densely flowered, the lower one rather distant, shortly pedunculated; bracteas very long, leafy, with very short scarcely any sheaths; fruit ovate, striated, with a short smooth bifid beak; scales ovate, mucronate; leaves very narrow, channeled; stem smooth; root fibrous.

English Botany, t. 833.—English Flora, vol. iv. p. 108.—Hooker, British Flora, ed. 4. vol. i. p. 338.—Lindley, Synopsis, p. 289.

Root tufted, with long branched fibres. *Stem* erect, about a foot high, slender, quite smooth, obtusely angular, naked above, leafy below. *Leaves* mostly as long as the stem, narrow, channeled from the incurved margins, rough on the margins towards the point, recurved, sheathed below. *Spike* terminal, compound. *Barren spikelet* terminal, mostly solitary, linear, cylindrical, with oblong obtuse brown scales, with a green mid-rib, *fertile* two or three, the upper sessile, or nearly so, the lower on a short peduncle, oblong, ovate, densely flowered, the scales brown, ovate, with a short bristle point,

the apex of the green mid-rib. *Bracteas* with short scarcely any sheaths, long, leafy, becoming deflexed, the lower one almost as long as the stem, narrow, channeled. *Fruit* ovate, green, striated, with a short beak, bifid, quite smooth. *Stigmas* three.

Habitat.—Marshes near the sea; rare. On the East and South Coasts of England; near Liverpool and Menai; Fifeshire, Scotland; and several parts of Ireland.

Perennial; flowering in June.

This is a very distinct species, readily known by its nearly sessile spikelets in the axis of the very long leafy at length deflexed bracteas, its quite smooth stem, and long narrow convolute leaves, the smooth short beaked striated fruit finely punctated, and obtuse mucronate scales.

2. Fertile spikelets stalked, erect.

36. *C. pallas'cens*, Linn. (Fig. 1418.) *Pale Carex*. Barren spikelet terminal, solitary; fertile scarcely drooping, approximate, oblong-ovate, densely flowered; bracteas leafy, sheathed; stigmas three; fruit elliptic, oblong, obtuse, tumid, striated, smooth, scarcely beaked; leaves slightly downy, sheathed; root fibrous.

English Botany, t. 2185.—English Flora, vol. iv. p. 105.—Hooker, British Flora, ed. 4. vol. i. p. 338.—Lindley, Synopsis, p. 289.

Root tufted, fibrous. *Stem* erect, about a foot high, slender, angular, rough, naked above, leafy below. *Leaves* linear, flat, striated, rough on the margins and keel, more or less downy, especially the sheaths. *Bractea* leafy, erect, with very short sheaths. *Barren spikelets* terminal, linear, cylindrical, with pale brown lanceolate scales, *fertile spikelets* elevated on slender peduncles, about three, the lower one remote from the others, and with a rather longer peduncle, and somewhat drooping, oblong, ovate, obtuse, densely crowded. *Fruit* green, smooth, elliptic, oblong, obtuse, slightly striated, without or with a very short beak, longer than the oblong acute scales, brown, with a green mid-rib, terminating in the point. *Stigmas* three.

Habitat.—Marshy places; frequent.

Perennial; flowering in June.

37. *C. panicea*, Linn. (Fig. 1419.) *Pink-leaved Carex*. Barren spikelet solitary; fertile spikelets mostly two, remote, erect, with distant flowers, especially the lower one; bracteas leafy, sheathed; stigmas three; fruit sub-globoso-ovate, smooth, with a short beak, entire; leaves linear; stem smooth; root creeping.

English Botany, t. 1505.—English Flora, vol. iv. p. 114.—Hooker, British Flora, ed. 4. vol. i. p. 340.—Lindley, Synopsis, p. 290.

Root creeping. *Stem* erect, from twelve to eighteen inches high, smooth, slender, angular, leafy below. *Leaves* linear, a glaucous green, flat, sheathed, smooth, except on the margins and keel towards the point. *Bracteas* leafy, erect, the sheaths long, pale. *Barren*

spikelet terminal, solitary, linear, cylindrical, with brown obtuse scales, the mid-rib and margin pale, *fertile* spikelets two or three, distant, cylindrical, linear, the upper ones with the florets loose, the lower one with the florets especially towards the base distant, the scales dark brown, ovate lanceolate, with a green mid-rib *Fruit* sub-globose, ovate, somewhat inflated, quite smooth, ribbed, longer than the scales, the beak very short, bifid, a greenish brown colour. *Stigmas* three.

Habitat.—Marshy places; common.

Perennial; flowering in May and June.

38. *C. speirosta'chya*, Sm. (Fig. 1420.) *Short brown spiked Carex*. Barren spikelet solitary; fertile spikelets one to three, remote, erect, with lax flowers, on slender peduncles, longer than the sheaths of the leafy bracteas; fruit smooth, obsoletely ribbed, elliptic lanceolate, with an acuminate obliquely bifid recurved beak, longer than the ovate scales; leaves broadly linear, smooth, except the margins near the point; stem smooth, striated; root creeping.

English Botany, t. 2731.—English Flora, vol. iv. p. 98.—Hooker, British Flora, ed. 4. vol. i. p. 340.—Lindley, Synopsis, p. 288—*C. sabina*, Don. Herb. Brit. n. 216.—*C. Scotica*, Spreng.—*C. vaginata*, Tausch. Bot. zig. 1821.

Root creeping. *Stem* erect, slender, triangular, striated, quite smooth, from twelve to eighteen inches high, leafy below. *Leaves* somewhat glaucous green, broadly linear, acuminate, flat, smooth, except on the margin towards the point. *Bracteas* short, leafy, erect, sheathed. *Barren spikelets* terminal, solitary, linear, with oblong brown scales, with a green mid-rib and narrow pale margin, *fertile* spikelets one to three, distant, on slender erect peduncles, the upper one as long, the lower longer than the sheath of the bracteas, *flowers* lax, not distant, as in the last species, the scales ovate, acute. *Fruit* smooth, pale green, or brownish upwards, elliptic lanceolate, with an acuminate beak, obliquely bifid, and somewhat recurved, longer than the scales, triangular, ribbed. *Stigmas* three.

Habitat.—High Mountains of Scotland. Craigchallaich.—*Mr. Borrer*. Cairngorum and Ben-y-mac-dowie.—*Mr. G. Don*. Clove.—*Mr. T. D. Hooker*.

Perennial; flowering in July.

39. *C. ful'va*, Gooden. (Fig. 1421.) *Tawny Carex*. Barren spikelet terminal, solitary; fertile erect, ovate, densely flowered, pedunculated, remote; bracteas sheathed; stigmas three; fruit ovate, sub-inflated, smooth ribbed, acuminate into a straight beak, bifid at the apex, rough on the margins; scales ovate, acute; stem rough; root tufted.

English Botany, t. 1296.—English Flora, vol. iv. p. 107.—Hooker, British Flora, ed. 4. vol. i. p. 338.—Lindley, Synopsis, p. 289.

β. sperioistachya. Fertile spikelets mostly three; fruit with a membranous orifice, nearly smooth; stem nearly smooth.



1419

Carex panicea.



1490

Carex phaeostachya.



1491

Carex fulva.



1492

Carex punctata.



1493

Carex distans.



1494

Carex binervis.



Hooker, British Flora, ed. 4. vol. i. p. 338.—*S. speristachya*, Sw.—English Botany, t. 2770.—English Flora, vol. iv. p. 98.—Lindley, Synopsis, p. 288.—*C. Horuschuchina*, Hoppe.—*C. Hosteana*, De Cand.

Root tufted, somewhat creeping. *Stem* erect, slender, about a foot high, leafy below, naked above, angular, and smooth or roughish upwards. *Leaves* linear, acuminate, erect, short, striated, rough on the edges and keel, sheathed, and with an oblong membranous *stipule*. *Bracteas* leafy, with close sheaths, those of the upper spikelets nearly as long as the peduncle, of the lower about half as long. *Barren* spikelet terminal, cylindrical, slender, its scales brown, membranous, ovate, obtuse. *Fertile* spikelets ovate, obtuse, erect, two or three, when there are three two are near together towards the top of the stem, the lower one is always distant, and on a slender peduncle. *Fruit* rather lax, spreading, greenish brown, ovate, somewhat inflated, striated, smooth, acuminate into a rather long straight beak, bifid at the apex, and more or less rough on the margins, longer than the ovate acute brown *scale*, with a pale membranous margin. *Stigmas* three.

Habitat.—Boggy meadows; not unfrequent. β . Mugdoch Castle, and several other parts of Scotland.

Perennial; flowering in June.

40. *C. punctata*, Gand. (Fig. 1422.) *Dotted fruited Carex*. Barren spikelets one, rarely two, with obtuse ferruginous scales; fertile three or four, erect, remote, densely flowered, pedunculated, the lower one longer than the sheath of the leafy bractea; stigmas three; fruit ovate, tumid, smooth, pellucidly punctate, diverging, of a pale green, obsoletely ribbed, except at the margins, the beak short, acuminate, bifid, smooth, larger than the ovate acute mucronate scale; stem smooth; leaves narrow, linear, plane, sheathed, with an oblong ligula; root creeping.

Hooker, British Flora, ed. 4. vol. i. p. 338.—*C. Helvetica*, Schleich.

Root creeping, and with tough woody fibres. *Stem* erect, from twelve to eighteen inches high, smooth, angular, striated, leafy below. *Leaves* narrow, linear, flat, shorter than the stem, with a striated sheath, and an opposite oblong obtuse membranous *ligule*. *Bracteas* leafy, with striated sheaths, auricled at the top. *Barren* spikelet single, rarely two, linear, cylindrical, with brown obtuse scales, *fertile* three, rarely four, ovato-cylindrical, erect, pedunculated, the upper ones with short stalks, and approximate, the lower longer, and more distant, the *scales* ovate, acuminate, with a short point, brown, membranous, with a pale narrow margin and green mid rib, shorter than the fruit, the peduncles roughish. *Fruit* ovate, tumid, convex on both sides, green, smooth, obscurely ribbed, except on the margins, green, shining, and beautifully punctated under a magnifying power, the beak linear, about one-third the length of the fruit, bifid. *Stigmas* three.

Habitat.—Near Beaumaris, North Wales.—*Dawson Turner, Esq.*
Menai, near Bangor.—*Mr. W. Wilson.*

Perennial; flowering in June.

This species is more frequent on the Continent than with us. It is nearly related to the following, but is a smaller plant, paler green, and readily known by its fruit.

41. *C. distans*, Linn. (Fig. 1423.) *Loose Carex*. Barren spikelet terminal, solitary, with oblong obtuse scales; fertile three, erect, ovate oblong, densely flowered, remote, the upper one nearly sessile, the lower with a long slender peduncle; bractees leafy, sheathing; stigmas three; fruit ovate, triquetrous, ribbed, with a short straight bifid beak, smooth or rough on the margins, longer than the ovate obtuse mucronate scales; stem smooth; leaves linear, with an oblong ligule; root fibrous.

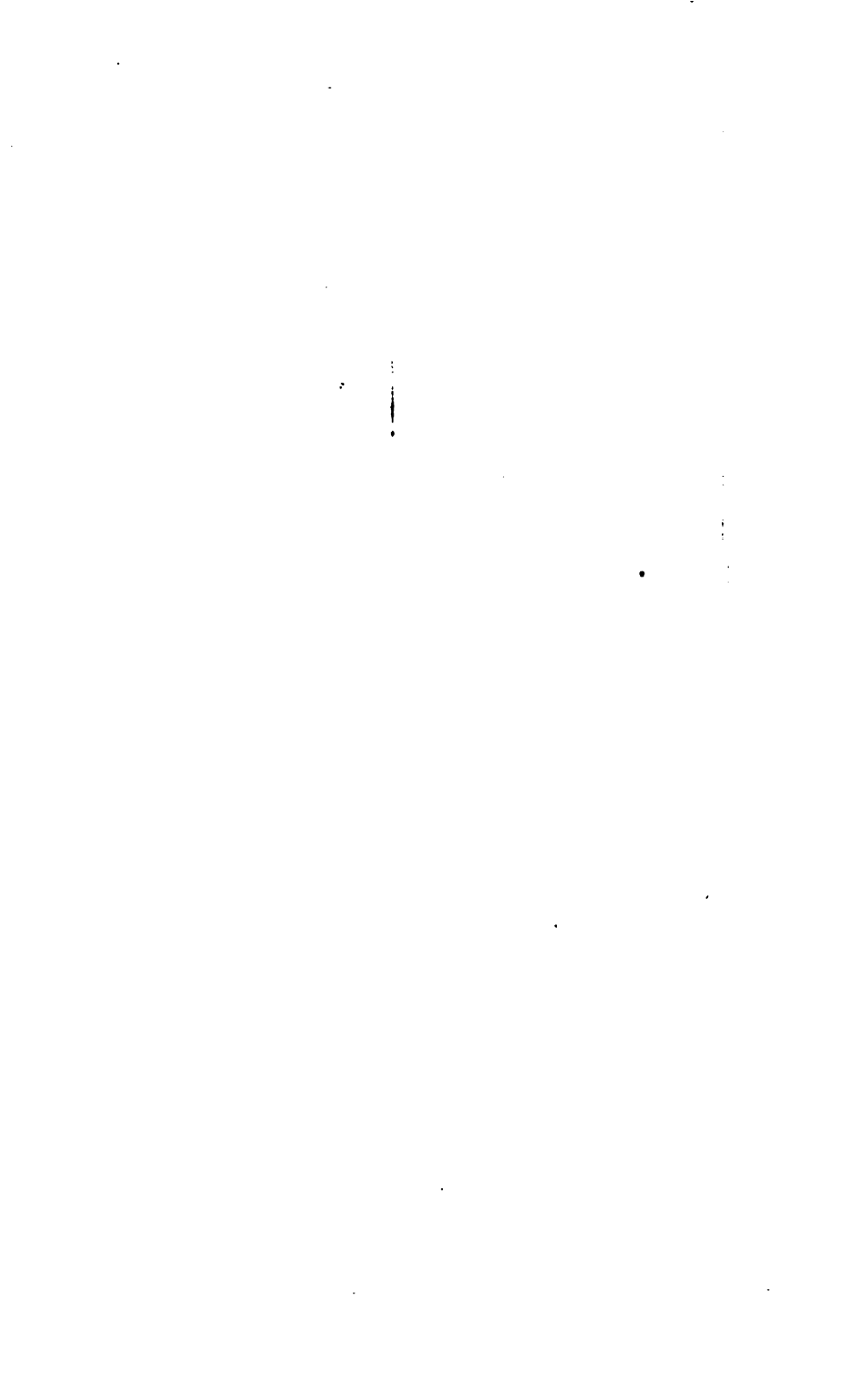
English Botany, t. 1234.—English Flora, vol. iv. p. 109.—Hooker, British Flora, ed. 4. vol. i. p. 339.—Lindley, Synopsis, p. 289.

Root fibrous, tufted. *Stem* ascending, from twelve to eighteen inches high, weak, obtusely triangular, smooth, except occasionally at the top, leafy. *Leaves* linear, rather long, darkish green, rough on the keel and margins towards the point, sheathed, striated, with an oblong membranous ligule. *Bractees* leafy, the lower one long, with a long close sheath, the uppermost bristle-shaped, with a very short sheath. *Barren spikelets* terminal, linear, with oblong obtuse brown scales, with a pale mid-rib, often terminating in a point, *fertile* spikelets three, oblong, ovate, densely flowered, erect, the upper one nearly sessile, the middle one with a slender peduncle, longer than the sheath, approaching the upper spikelet, the lower one much more distant, and with a longer peduncle. *Scales* ovate, obtuse, dark shining brown, with a green mid-rib, terminating in a point, often roughish. *Fruit* ovate, triquetrous, sub inflated, with a short acuminate bifid point, obscurely ribbed, the angles green, and rather prominent, longer than the scales. *Stigmas* three.

Habitat.—Muddy marshes, especially near the sea; not uncommon.

Perennial; flowering in June.

42. *C. binervis*, Smith. (Fig. 1424.) *Green ribbed Carex*. Barren spikelet terminal, solitary, with oblong obtuse scales; fertile three, erect, ovate oblong, densely flowered, remote, the upper one nearly sessile, the lower with a long slender peduncle; bractees leafy, sheathing; stigmas three; fruit ovate, triquetrous, smooth, with two principal green ribs near the margin on the outer surface, the beak rather broad, bifid, smooth on the margins, longer than the ovate obtuse mucronate scales; stem smooth; leaves linear, with an oblong ligule; root fibrous.





1495 *Carex laevigata.*



1496 *Carex depauperata.*



1497 *Carex sylvatica.*



1498 *Carex strigosa.*



1499 *Carex pendula.*



1490 *Carex Pseudo-cyperus.*

English Botany, t. 1235.—English Flora, vol. iv. p. 110.—Hooker, British Flora, ed. 4. vol. i. p. 389.—Lindley, Synopsis, p. 289.

Root fibrous, tufted. *Stem* erect, from one to two feet high, obtusely angular, striated, smooth, except occasionally roughish at the top, leafy. *Leaves* linear, with a long tapering point, rough on the margins and keel, sheathed, the *ligula* oblong, membranous. *Bracteas* leafy, the lower ones long, the upper short, and with the sheath proportionately so. *Barren spikelet* terminal, linear, oblong, the scales brown, oblong, obtuse, with a pale mid-rib, terminating in a short often rough point, *fertile spikelets* three to five, erect, ovato-oblong, crowded, the upper spikelets often approximating, and nearly sessile, but the lower ones distant, with the peduncles longer than the sheaths of the bractea. *Scales* ovate, obtuse, dark brown, with a pale mid-rib, terminating in a short rough mucronated point, shorter than the fruit. *Fruit* ovate, triquetrous, smooth, dark shining brown, with a rather broad bifid beak, smooth, or rarely roughish, convex at the back, and obsoletely ribbed, but with two distinct marginal green ribs. *Stigmas* three.

Habitat.—Dry heaths and moors; frequent.

Perennial; flowering in June.

This is nearly allied to *C. distans*, from which it is sometimes very difficult to distinguish, and often the only marked character is in the green ribs of the fruit. The spikelets are sometimes compound, bearing barren flowers towards the top. It is variable in size, sometimes not a foot high, and at others more than two feet.

43. *C. laxigata*, Smith. (Fig. 1425.) *Smooth stalked beaked Carex*, Barren spikelet terminal, solitary, with linear oblong mucronate scales; fertile three or four, remote, cylindrical, densely flowered, the lower one with a long peduncle, drooping; bracteas leafy, with elongated sheaths; stigmas three; fruit ovate, triquetrous, striated, with a rather long acuminate bifid beak, rough, longer than the lanceolate mucronate scales; stem smooth; leaves broadly linear, with an oblong ligule, root fibrous.

English Botany, t. 1387.—English Flora, vol. iv. p. 122.—Hooker, British Flora, ed. 4. vol. i. p. 386.—Lindley, Synopsis, p. 291.

Root tufted, fibrous. *Stem* erect, from two to three feet high, obtusely triangular, smooth, striated, leafy below. *Leaves* broadly linear, rather short, erect, a bright green, smooth, except on the margins and keel towards the point, sheathed, with an oblong brown membranous *ligule*. *Barren spikelets* solitary, rarely two, terminal, with pale brown linear oblong scales, the mid-rib pale, terminating in a point, *fertile* three or four, oblong, obtuse, densely flowered, cylindrical, the upper ones nearly sessile, the lower ones more remote, on slender peduncles, longer than the sheaths of the leafy bractea, and sometimes drooping. *Scales* dark brown, lanceolate, with a pale mid-

rib, terminating in a point, and mostly rough. *Fruit* ovate, somewhat inflated, triquetrous, striated, terminating in a flattish rather long beak, deeply bifid at the apex, and rough on the margins, longer than the scales. *Stigmas* three.

Habitat.—Marshy and boggy places in several parts of England and Scotland; Anglesea and Belfast, Ireland.

Perennial; flowering in June.

Readily distinguished by its lanceolate scales and the green fruit, with its long flat rough margined beak. It is a larger stouter plant than any other of the species of this section.

44. *C. depauperata*, Gooden. (Fig. 1426.) *Starved Wood Carex*. Barren spikelet solitary, with oblong acute scales; fertile three, distant, few flowered, on long slender peduncles; bractees leafy, sheathing; fruit large, globoso-inflated, striated, with a long slender beak, bifid, pointed, longer than the ovate lanceolate scales; leaves linear, rough; stem smooth; root somewhat creeping.

English Botany, t. 1298.—English Flora, vol. iv. p. 97.—Hooker, British Flora, ed. 4. vol. i. p. 340.—Lindley, Synopsis, p. 287.

Root somewhat creeping. *Stem* erect, from twelve to eighteen inches high, obtusely angular, smooth, except towards the top it is often roughish, leafy. *Leaves* linear, bright green, rough on the edges and keel, with long close sheaths, striated. *Bractees* long, leafy, erect, with short sheaths. *Barren spikelets* solitary, terminal, linear, with oblong acute brown scales, with a narrow pale thin membranous margin, often torn, and a pale mid-rib terminating below the point, *fertile* two or three, distant, of about five florets, lax, erect, on a slender peduncle. *Scales* ovate lanceolate, green, with a broad pale membranous margin. *Fruit* large, globoso-inflated, smooth green, numerous striated, with a long narrow straight bifid, beak smooth, or somewhat rough on the margins. *Stigmas* three.

Habitat.—Dry Woods; rare. Godalming, Surrey; Charlton Wood, Kent; and near Forfar, Scotland.

Perennial; flowering in May and June.

3. *Fertile spikelets stalked, drooping.*

† *Fertile spikelets elongated.*

45. *C. sylvatica*, Huds. (Fig. 1427.) *Pendulous Wood Carex*. Barren spikelet solitary, with lanceolate scales; fertile four, remote; peduncles longer than the sheaths of the leafy bractea; filiform slender, drooping, with lax flowers; stigmas three; fruit elliptic, triangular, very smooth, with a linear tapered beak, bifid at the apex; leaves broadly linear; root tufted.

English Botany, t. 995.—English Flora, vol. iv. p. 96.—Hooker, British Flora, ed. 4. vol. i. p. 341.—Lindley, Synopsis, p. 287.

Root fibrous, tufted. *Stem* ascending, about a foot high, triangular, smooth, slender, leafy below. *Leaves* bright green, numerous,

long, broadly linear, striated, roughish on the keel and margins, sheathed, and the base enveloped in lanceolate scales, with membranous margins. *Bracteas* long, leafy, with close elongated scales. *Barren spikelet* terminal, linear, with oblong lanceolate scale, pale brown, *fertile* three or four, elongated, narrow, loosely flowered, drooping, on long slender peduncles, especially the lower ones. *Scales* lanceolate, membranous, pale, with a broad green rib, terminating in a longish tapering rough point. *Fruit* green, or pale brown, elliptic, triangular, smooth, tapering into a long narrow rough beak, bifid at the apex. *Stigmas* three.

Habitat.—Moist Woods; frequent.

Perennial; flowering in May and June.

Linnaeus, who describes this as a Lapland plant, says it is carded and dressed by the inhabitants and used as wadding to protect them from cold. Its long pliant stems and leaves might here also be applied to many useful purposes. It is very abundant in moist woods, but does not appear to be a plant which cattle are fond of.

46. *C. strigo'sa*, Huds. (Fig. 1428.) *Loose pendulous Carex*. Barren spikelet solitary, with oblong lanceolate scales; fertile three or four, remote, erect, with peduncles, scarcely as long as the sheaths of the leafy bractea, filiform, with lax flowers; stigmas three; fruit ovate lanceolate, striated, with a very short scarcely bifid beak; leaves broadly linear; root fibrous.

English Botany, t. 994.—English Flora, vol. iv. p. 95.—Hooker, British Flora, ed. 4. vol. i. p. 341.—Lindley, Synopsis, p. 287.

Root with long fibrous branches. *Stem* erect, about two feet high, triangular, smooth, leafy. *Leaves* broadly linear, a bright green, striated, roughish on the margins and keel, with rather long sheathing base. *Bracteas* long, leafy, with close sheaths and obtuse membranous auricles on each side at the top. *Barren spikelet* terminal, long, narrow, linear, pale brown, with linear lanceolate scales, *fertile* nearly erect, three or four on peduncles, not longer than the sheaths of the bractea, long, linear, loosely flowered, with pale membranous lanceolate scales, with a slender mid-rib, shorter than the fruit. *Fruit* pale brown or green, ovate lanceolate, striated, somewhat curved towards the point, the beak very short, obtuse, scarcely bifid. *Stigmas* three.

Habitat.—Groves and thickets in several of the Middle and East parts of England; Armiston Woods, near Edinburgh.

Perennial; flowering in May and June.

47. *C. pen'dula*, Huds. (Fig. 1429.) *Great pendulous Carex*. Barren spikelet solitary, terminal, with brown linear lanceolate scales; fertile mostly four, rather distant, long, cylindrical, densely flowered, drooping; scales lanceolate, bristle pointed; stigmas three; fruit ovate, acuminate, striated, the beak short, bifid; stem short; leaves broad, linear; root fibrous, tufted.

English Botany, t. 2315.—English Flora, vol. iv. p. 95.—Hooker, British Flora, ed. 4. vol. i. p. 341.—Lindley, Synopsis, p. 287.—*O. Maxima, Scopio*

Root fibrous, tufted. *Stem* erect, from three to six feet high, stout, triangular, smooth, except towards the top, leafy. *Leaves* large, broad, lanceolate, long, recurved, grass green, glaucous beneath, rough on the angles and ribs, sheathed. *Bractees* of the lower spikelets large and leafy, with sheaths as long as the peduncles of the spikelets, the upper small or wanting. *Barren spikelets* terminal, solitary, long, slender, cylindrical, with brown linear lanceolate scales, *fertile* spikelets three or four inches long, slender, cylindrical, drooping, densely flowered, the upper sessile, the lower pedunculated. *Scales* brown, lanceolate, with a broad green mid-rib, terminating in a bristle point, of greater or less length. *Fruit* ovate, triquetrous, acuminate, with a short bifid beak, smooth. *Stigmas* three.

Habitat.—Moist woods and shady places; not very common.

Perennial; flowering in May and June.

48. *C. Pseudo-cyperus*, Linn. (Fig. 1430.) *Cyperus-like Carex*. Barren spikelet terminal, solitary, with an awl-shaped scale; fertile four to six, long, cylindrical, densely flowered, drooping, with ovate awl-shaped scales; stigmas three; fruit ovate lanceolate, with a short deeply bifid beak, smooth, striated; bractees leafy; stem acutely triangular; leaves broadly linear, striated, rough; root fibrous.

English Botany, t. 242.—English Flora, vol. iv. p. 101.—Hooker, British Flora, ed. 4. vol. i. p. 342.—Lindley, Synopsis, p. 288.

Root fibrous. *Stem* erect, from two to three feet high, acutely triangular, leafy. *Leaves* broadly linear, long, rough, striated, and sheathed at the base. *Bractea* long, leafy, similar to the leaves, with short sheaths, recurved. *Barren spikelet* solitary, terminal, long, slender, cylindrical, with long rough awl-shaped scales, the *fertile* four or five, collected towards the top of the stem, two to three inches long, cylindrical, densely flowered, drooping, its scales long, awl-shaped, rough, with a somewhat ovate base. *Stigmas* three. *Fruit* green, triangular, lanceolate, tapering into a short broad deeply bifid beak, numerous striated, and rough on the angles.

Habitat.—Moist places by the side of lakes and pools; but not common.

Perennial; flowering in June.

This is an extremely beautiful species, remarkable from its spikelets being collected towards the top of the stem, from whence drooping down they have an elegant appearance, and the long rough scales give them a light airiness, readily distinguishing it from all other of our species.

49. *C. recurva*, Huels. (Fig. 1431) *Glaucous Heath Carex*. Barren spikelets one or two, with a dark brown oblong obtuse scales; fertile



1431

Carex recurva.



1432

Carex capillaris.



1433

Carex limosa.



1434

Carex rariflora.



1435

Carex ustulata.



1436

Carex procox.

three or four, cylindrical, remote, densely flowered, on long peduncles, at length drooping; scales almost black, oblong; bractees leafy, the lower ones sheathed; stigmas three; fruit elliptic, obtuse, with a short entire beak, smooth or roughish; stem triangular, smooth; leaves linear, rough; root creeping.

English Botany, t. 1506.—English Flora, p. 114.—Hooker, British Flora, ed. 4. vol. i. p. 342.—Lindley, Synopsis, p. 290.—*C. Michxliana*.—English Botany, t. 2286, (*fruit smooth*).—*C. stictocarpa*, Smith.—English Botany, t. 2772.—English Flora, vol. iv. p. 127.—Lindley, Synopsis, p. 292.—*C. glauca*, Scop.

Root creeping. *Stem* erect, from twelve to eighteen inches high, acutely angular, smooth and leafy below, roughish above. *Leaves* linear, a glaucous green, rough on the edges and keel. *Bractees* leafy, the lower one long, and sheathed at the base, the upper small, without sheaths, all with a dark brown membranous auricle at the base. *Barren spikelets* one, two, and occasionally three, linear, with dark brown almost black oblong lanceolate scales, with a slender pale mid-rib, *fertile* three or four, linear, cylindrical, densely flowered, but not unfrequently, the lower spikelets are loosely and sometimes distantly flowered at the base, and the upper ones are sometimes barren, the lower spikelets are on long slender at length drooping peduncles, and the upper ones are sessile, or nearly so. *Scales* dark brown, almost black, ovate lanceolate, or acute, with a slender pale mid-rib, shorter than the fruit. *Fruit* elliptic oblong, obtuse, bluntly angular, a rusty green, becoming black, smooth or roughish, with a short entire or slightly notched beak. *Stigmas* three.

Habitat.—Moist meadows, moors, groves, and alpine rocks.

Perennial; flowering in June.

This is a generally distributed plant, and variable in its size and rigidity from the different situations of its growth; its very glaucous leaves, dark obtuse scales, and obtuse short beaked fruit smooth or roughish, well distinguish it.

†† *Fertile spikelets short.*

50. *C. capillar'is*, Linn. (Fig. 1432.) *Dwarf capillary Carex*. Barren spikelet solitary, with lanceolate scales; fertile two or three, drooping, of few lax flowers, on slender peduncles; scales ovate, obtuse, pale, membranous; fruit oblong, triangular, acuminate, and both ends smooth, shining, longer than the scales; stigmas three; bractea leafy, sheathed; leaves linear, flat; root fibrous.

English Botany, t. 2069.—English Flora, vol. iv. p. 100.—Hooker, British Flora, ed. 4. vol. i. p. 340.—Lindley, Synopsis, p. 288.

Root fibrous, tufted. *Stem* slender, erect, roundish, striated, smooth, leafy below, two to six inches high. *Leaves* linear, plane, scarcely half as long as the stem, pliant, spreading, rough only towards the apex. *Bractea* mostly solitary near the top of the stem,

leafy, sheathing at the base, and mostly enveloping the base of all the peduncles. *Barren spikelet* solitary, small, shorter than the peduncles of the fertile spikelets, its *scales* membranous, lanceolate, *fertile* spikelets three or four, of from six to eight florets, lax, drooping on slender hair-like peduncles, rough, the *scales* pale brown, membranous, soon falling away, broadly ovate, shorter than the fruit. *Fruit* elliptic ovate, tapering at both ends, dark brown, smooth and shining, triangular, with a round obliquely pointed beak. *Stigmas* three.

Habitat.—Plentiful on the Highland Mountains of Scotland, especially the Breadalbane range; on Ben-y-Gloe.

Perennial; flowering in June and July.

51. *C. limosa*, Linn. (Fig. 1433) *Mud Carex*. Barren spikelet solitary, with lanceolate acute scales; fertile one or two, oblong, ovate, densely flowered, on slender drooping peduncles; scales ovate, acute; stigmas three; fruit roundish ovate, striated, the beak short, mucronate; bractees leafy, bi-auriculated, or shortly sheathed at the base; leaves very narrow, linear; root creeping.

English Botany, t. 2048.—English Flora, vol. iv. p. 102.—Hooker, British Flora, ed. 4. vol. i. p. 340.—Lindley, Synopsis, p. 288.

Root extensively creeping, with long branched fibres. *Stem* erect, or ascending, six to twelve inches high, slender, striated, triangular and rough on the angles, leafy below. *Leaves* very narrow, linear, erect, a glaucous green, rough on the margins and keel, sheathed at the base, and enveloped in purplish brown striated membranous sheaths. *Bractees* leafy, narrow, sheathed at the base, or with an obtuse dark membranous auricle on each side. *Barren spikelet* terminal, solitary, cylindrical, erect, its scales lanceolate, dark shining brown, with a green mid-rib, *fertile* spikelets one or two, ovate oblong, densely flowered, on slender somewhat drooping peduncles, its scales ovate lanceolate, acute, with a green mid-rib, terminating in a point, longer than the roundish ovate *fruit*, which is numerously striated, obtuse, with a short fine pointed beak, somewhat compressed, greenish brown. *Stigmas* three.

Habitat.—Bogs and marshes; rare in England, and mostly found in the northern counties and mountainous districts; not unfrequent in Scotland and Ireland.

Perennial; flowering in June.

52. *C. rariflora*, Smith. (Fig. 1434.) *Loose flowered alpine Carex*. Barren spikelet solitary, with oblong acute scales; fertile two or three, of few lax florets, drooping on slender peduncles; scales ovate, acute, longer than the fruit; fruit ovate, acute, tapering at the base, striated, the beak very short, slightly notched; stigmas three; bractees very slender, with large membranous auricles at the base; leaves linear; root creeping.

English Botany, t. 2516.—English Flora, vol. iv. p. 100.—Hooker,

British Flora, ed. 4. vol. i. p. 341.—Lindley, Synopsis, p. 288.—*C. limosa*, γ. Wahl.

Root widely creeping. *Stem* erect, obtusely angular, striated, smooth, about six inches high, naked above, leafy below. *Leaves* shorter than the stem, rather broadly linear, striated, and roughish on the margins and keel, sheathed at the base, and enveloped in purplish lanceolate scales. *Bractees* small, awl-shaped, rarely leafy, scarcely sheathed, but with large pale membranous auricles on each side at the base. *Barren spikelet* terminal, narrow, linear, with oblong acute scales, *fertile* spikelets mostly two, oblong, of about five to ten rather lax flowers, the scales broadly ovate, acute, with a pale mid-rib, terminating in the point, rather longer and broader than the fruit, peduncles slender, drooping. *Fruit* broadly ovate, acute, with a very short beak, scarcely bifid, tapering at the base, smooth, striated, green. *Stigmas* three.

Habitat.—Bog at the Head of Glen Dole, Angus-shire, Clove Mountains; several places in Sutherland, as Oikel, Ben Hope, Ben Luyal.

Perennial; flowering in June.

53. *C. ustulata*, Willd. (Fig. 1435.) *Scorched alpine Carex*. Barren spikelet solitary; fertile two or three, ovate, densely flowered; peduncles slender, pendulous; bractees scarcely leafy, sheathed; stigmas three; fruit elliptic, ovate, acuminate, compressed, smooth, black, with a short bifid beak; scale ovate, acute; leaves linear, flat, rough towards the point; root fibrous.

English Botany, t. 2404.—English Flora, vol. iv. p. 103.—Hooker, British Flora, ed. 4. vol. i. p. 341.—Lindley, Synopsis, p. 288.

Root fibrous, tufted. *Stem* erect, from three to four inches high, triangular, smooth, leafy below. *Leaves* short, rather broadly linear, acute, sheathed at the base, smooth, except on the margins and keel towards the point. *Bractees* small, awl-shaped, somewhat sheathed at the base. *Barren spikelet* terminal, on a short peduncle, *fertile* spikelets two or three, ovate, densely flowered, of a dark chocolate colour, on slender drooping peduncles, the scales ovate, acute, with pale mid-rib terminating in the point, about as long as the fruit. *Fruit* elliptic, ovate, acuminate, dark brown, almost black, smooth, compressed, with a short bifid beak, roughish on the angles above. *Stigmas* three.

Habitat.—Ben Lawers; very rare.—Mr. G. Don.

Perennial; flowering in July.

54. *C. irrigua*. (Smith secund Hartin.) *Marsh Carex*. Barren spikelet solitary; fertile two or three, oblong, densely flowered, on long slender peduncles, pendulous; bractees narrow, leafy, nearly flat, auriculated at the base; scales ovate lanceolate, attenuated, acute; fruit roundish ovate, obtuse, compressed, faintly ribbed, with a

very short entire beak; stigmas three; leaves linear, flat, smooth on the edges, except near the apex; root creeping.

Babington, *British Botany*, p. 346.

Root creeping. *Stem* slender, about a foot high. *Leaves* linear, broad, flat, smooth on the edges, except towards the apex. *Spikelets* ovate oblong, dense, drooping, dark purple. *Scales* longer than the fruit, purple. *Stigmas* three. *Bracteas* linear, broad, flat, auriculated at the base, and sometimes with a short sheath. *Fruit* pale, roundish ovate, lenticularly compressed, obtuse, smooth, faintly ribbed, beak short, obtuse, smooth.

Habitat.—Spongy Bogs; Muckle Moss, Northumberland; Terregles, Dumfriesshire, Scotland.

Perennial; flowering in June.

This species may be mistaken for *C. limosa*, but it is readily known by its shorter spikes and broader flat leaves, and smooth fruit, with its obtuse short beak.

b. *Fruit downy*.

1. *Fertile spikelets sessile*.

55. *C. praecox*, Jacq. (Fig. 1436.) *Vernal Carex*. Barren spikelet solitary, with oblong obtuse scales; fertile one to three, approximating, oblong, ovate, with oblong mucronate scales; bracteas awl-shaped, with a membranous sheath; stigmas three; fruit obovate, sub-triquetrous, acute, downy; leaves linear, glaucous; stem erect; root creeping.

English Botany, t. 1099.—*English Flora*, vol. iv. p. 111.—Hooker, *British Flora*, ed. 4. vol. i. p. 342.—Lindley, *Synopsis* p. 290.

Root branched and creeping. *Stem* erect, or ascending, from three to twelve inches high, slender, angular, nearly smooth, leafy below. *Leaves* numerous, linear, tapering, striated, a glaucous green, rough on the edges and keel, somewhat sheathed at the base. *Bracteas* short, awl-shaped, scarcely leafy, pale and membranous, sometimes sheathed at the base. *Barren spikelet* terminal, solitary, oblong, densely flowered, with oblong obtuse pale brown membranous scales, with a pale greenish mid-rib, *fertile* spikelets sessile, or nearly so, one, two, or three approximate, oblong, ovate, smaller than the barren spikelet, with oblong obtuse pale brown scales, the mid-rib green, rough, terminating in a bristle-shaped point. *Fruit* obovate, somewhat triangular, acute, downy, green, with a short conical entire beak. *Stigmas* three.

Habitat.—Dry heaths and pastures; frequent.

Perennial; flowering in April and May.

56. *C. pilulifera*, Linn. (Fig. 1437.) *Round-headed Carex*. Barren spikelet solitary, with lanceolate scales; fertile three or four, roundish, approximate; bracteas leafy, without sheaths; fruit sub-globose, acute, downy, with a short obliquely pointed beak; scales ovate,



1437

Carex pilulifera.



1438

Carex tomentosa.



1439

Carex clandestina.



1440

Carex digitata.



1441

Carex filiformis.



1442

Carex hirsuta.

acute, mucronate ; stem weak, angular, rough ; leaves linear, rough ; root fibrous.

English Botany, t. 885.—English Flora, vol. iv. p. 112.—Hooker, British Flora, ed. 4. vol. i. p. 342.—Lindley, Synopsis, p. 290.

Root fibrous, tufted. *Stem* slender, ascending, triangular, striated, rough above, leafy below, from six to twelve inches high. *Leaves* narrow, linear, striated, rough on the margins and keel, shorter than the stem, sheathed at the base, and enveloped in purple scales, becoming fibrous. *Bracteas* short, leafy, without sheaths. *Barren spikelet* terminal, solitary, linear, small, with lanceolate acute scales, brown, membranous, with a pale margin and mid-rib, *fertile* spikelets three or four, sessile, roundish, mostly crowded together, except the lower one, *scales* ovate, acute, brown, with a rough green mid-rib, terminating in a bristly point, about as long as the fruit. *Fruit* subglobose, acutely pointed, somewhat triangular, green, clothed with short pubescence, the beak short, obliquely pointed. *Stigmas* three.

Habitat.—Moory ground ; frequent.

Perennial ; flowering in June.

2. *Fertile spikelets stalked.*

57. *C. tomento'sa*, Linn. (Fig. 1438.) *Large downy fruited Carex*. Barren spikelet solitary, with oblong acute scales ; fertile one or two, cylindrical, obtuse, erect, with ovate acute scales ; bracteas leafy, erect, with a short sheath ; stigmas three ; fruit globose, with a short beak, scarcely bifid, densely downy ; stem erect, slender, rough ; leaves linear, flat, somewhat hairy ; root creeping.

English Botany, t. 2046.—English Flora, vol. iv. p. 113.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 290.

Root creeping, and with long fibrous radicles. *Stem* erect, slender, acutely angular, roughish above, leafy below, about a foot high. *Leaves* linear, acute, rather broad, flat, short, somewhat hairy, rough on the edges and keel, enveloped at the base in purple scales. *Bracteas* leafy, erect, the lower ones only with short sheaths. *Barren spikelets* terminal, solitary, oblong, ovate, with brown oblong acute scales, and a pale mid-rib, *fertile* spikelets two or three, sometimes single, the upper nearly sessile, the rest on short peduncles, rough, erect, the *scales* ovate, acute, brown, with a green mid rib, terminating in a short bristly point. *Fruit* sub-globoso-obovate, somewhat triangular, with a short beak, bifid, thickly clothed with grey pubescence. *Stigmas* three.

Habitat.—Meadows near Merston Mearsy, Wiltshire.

Perennial ; flowering in June.

58. *C. claudesi'na*, Gooden. (Fig. 1439.) *Dwarf silvery Carex*. Barren spikelet solitary, pedunculated, with ovate lanceolate scales ; fertile two or three, remote, few flowered, concealed by the membranous bracteas ; stigmas three ; fruit obovate, triquetrous, with a short

beak, and contracted towards the base, downy; leaves longer than the stem, channeled, rigid; root fibrous.

English Botany, t. 2124.—English Flora, vol. iv. p. 94.—Hooker, British Flora, ed. 4. vol. i. p. 342.—Lindley, Synopsis, p. 287.—*C. Humilis*, Leysser.

Root with stout fibres. *Stem* erect, from one to three inches high, leafy below. *Leaves* erect or spreading, as long or longer than the stem, numerous, narrow, linear, channeled, rough and rigid, more or less sheathed at the base. *Bracteas* oblong, acute, thin, membranous, white and shining. *Barren spikelet* terminal, linear, pedunculated, the scales ovate lanceolate, pale, somewhat silvery brown, *fertile* spikelets two or three, on short peduncles, three or four flowered, concealed by the bracteas. *Fruit* obovate, triangular, with a short acute beak, downy towards the apex, and contracted towards the base, *Stigmas* three, long.

Habitat.—On the limestone rocks at St Vincent's, Bristol.

Perennial; flowering in May.

59. *C. digitata*, Linn. (Fig. 1440.) *Fingered Carex*. Barren spikelet sessile, solitary, with lanceolate scales; fertile pedunculated, about three, erect, lax, filiform, longer than the barren one; scales ovate, obtuse, or truncated; stigmas three; fruit obovate, triquetrous, with a short beak, downy, contracted at the base; bracteas submembranous, sheathing; leaves linear, flat; root fibrous, tufted.

English Botany, t. 615.—English Flora, vol. iv. p. 93.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 287.

Root tufted, fibrous. *Stem* ascending, from six to eight inches high, slender, striated, smooth, naked above, leafy below, and enveloped in dark red sheaths. *Leaves* linear, acutely pointed, striated, rough on the margins and keel, erect, flat, paler beneath than above. *Bractea* greenish, sheaths with membranous margins, obtuse, with a bristle-shaped point. *Barren spikelet* sessile, terminal, slender, linear, with reddish brown lanceolate membranous scales, *fertile* three or four, pedunculated, remote, the upper ones overtopping the barren one, long, linear, loosely flowered, with reddish brown truncated scales, with a pale margin and green mid-rib, terminating in a short point. *Fruit* obovate, triangular, with a short entire beak, and contracted into peduncle at the base, downy, green. *Stigmas* three.

Habitat.—Near Bath and Bristol, and below Thorp Arch and Mackershaw Wood, Ripon, Yorkshire; very rare.

Perennial; flowering in May.

Sect. 5. *Terminal spikelets barren two or more, the rest fertile.*
Stigmas three

a *Fruit downy.*

60 *C. filiformis*, Linn (Fig. 1441.) *Slender-leaved Carex*. Barren spikelets two, with narrow lanceolate scales; fertile two or three

distant, oblong, ovate, densely flowered, sessile, or the lower one pedunculated; scales mucronate or cuspidate; fruit ovate, turgid, with a short obliquely truncated bifid beak, very pubescent; bractea leafy, with very short sheaths; stem slender, nearly smooth; leaves long, narrow, channeled; root creeping.

English Botany, t. 904.—English Flora, vol. iv. p. 128.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 292.

Root creeping, the whole plant free from pubescence, except the fruit. *Stem* erect, one to two feet high, slender, obtusely triangular, smooth, except towards the top, naked above, leafy below. *Leaves* long, not wider than the stem, erect, channeled, striated, rough, sheathed at the base, and enveloped in lanceolate scales. *Bracteas* leafy, very slender, and without or with very short sheaths at the base. *Barren spikelets* two or three, seldom only one, narrow, linear, terminal, with narrow lanceolate brown scales, with a paler mid-rib, terminating in the point, *fertile* spikelets two or three, rather distant, oblong, ovate, cylindrical, densely flowered, the upper sessile, the lower on a short peduncle, *scales* oblong, obtuse, with the green mid-rib terminating in a point of greater or less length. *Fruit* ovate or oblong, ovate, turgid, with a short obliquely truncated deeply bifid beak, densely clothed with hairy pubescence. *Stigmas* three.

Habitat.—Boggy marshes, rare; chiefly in Scotland; near Yarmouth, Cheshire, and Anglesea.

Perennial; flowering in May.

61. *C. hirta*, Linn. (Fig. 1442.) *Hairy Carex*. Barren spikelets two, with obtuse mucronate scales; fertile two or three, oblong, cylindrical, erect, the lower pedunculated; scales oblong, with long rough bristly points; fruit ovate, with a long deeply bifid beak, hairy; bracteas leafy, with sheaths as long as the peduncles; stem smooth; leaves and sheaths hairy; root creeping.

English Botany, t. 686.—English Flora, vol. iv. p. 125.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 292.

Root extensively creeping, and with fibrous radicles. *Stems* mostly tufted, erect, about two feet high, smooth or roughish upwards, obtusely angular, striated. *Leaves* numerous, broadly linear, with a long tapering point, striated, sheathed, and clothed more or less thickly with soft yellowish pubescence. *Barren spikelets* two or three, terminal, with brown obtuse *scales*, with a pale mid-rib, terminating in a short point, *fertile* spikelets two or three, distant, linear, oblong, cylindrical, rather loosely flowered, erect, the upper sessile, or nearly so, the lower on peduncles, as long as the sheaths of the leafy *bracteas*, the *scales* oblong, pale, membranous, with the green mid-rib terminating in a long rough bristly point. *Fruit* ovate, with a long beak, deeply cloven, clothed with roughish pubescence. *Stigmas* three.

Habitat.—Wet shady places and pastures; frequent.
Perennial; flowering in May and June.

b. *Fruit smooth*.

62. *C. ampullacea*, Gooden. (Fig. 1443.) *Slender beaked Bottle Carex*. Barren spikelets one to three, linear, with oblong scales; fertile two or three, rather distant, long, cylindrical, on short peduncles, erect, with lanceolate scales; fruit sub-globose, inflated, smooth, with a slender linear bifid beak; bracteas leafy, without sheath; leaves linear, channeled, glaucous; stem obtusely angular; root creeping.

English Botany, t. 780.—English Flora, vol. iv. p. 124.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 292.

Root creeping. *Stem* erect, from one to two feet high, obtusely angular, smooth, or a little rough at the top. *Leaves* linear, with a long tapering point, striated, a glaucous green, rough on the edges and keel, towards the point sheathed. *Bracteas* leafy, the lower one very long, without or with very short sheaths. *Barren spikelets* two or three, terminal, long, slender, cylindrical. *Scales* oblong, ovate, brown, with a narrow white membranous margin, often torn, *fertile* spikelets two or three, rather distant from each other, erect, or slightly drooping, from one to two inches long, cylindrical, densely flowered, with pale brown lanceolate *scales*, with a green rib. *Fruit* globose, inflated, smooth, green, striated, the beak slender, linear, compressed, more than half as long as the fruit, the beak bifid. *Stigmas* three.

Habitat.—Pools, marshes, and the banks of rivers; not very common; most frequent in Scotland.

Perennial; flowering in May.

63. *C. vasicaria*, Linn. (Fig. 1444.) *Short-spiked Bladder Carex*. Barren spikelets one to three, linear, with lanceolate scales; fertile two to four, rather distant, oblong, cylindrical, sessile, or on short peduncles, erect, with lanceolate scales; fruit ovato-conical, inflated, smooth, with a slender tapering bifid beak; bracteas leafy, without sheaths; leaves broadly linear, flat; stem acutely angular, rough; root creeping.

English Botany, t. 779.—English Flora, vol. iv. p. 123.—Hooker, British Flora, ed. 4. vol. i. p. 343.—Lindley, Synopsis, p. 291.

Root creeping. *Stem* erect, about two feet high, acutely angular, and rough, especially upwards, leafy below. *Leaves* rather broadly linear, bright green, rough on the margins and keel, striated, sheathed at the base. *Bracteas* leafy, without sheaths, the lower ones long, erect. *Barren spikelets* two or three, linear, long, with dark brown lanceolate scales, with a pale mid-rib and scarious margin, *fertile* two to four, oblong, cylindrical, the upper ones mostly sessile, the lower on short peduncles, densely flowered, the *scales* narrow, lanceolate,



1443

Carex ampullacea.



1444

Carex vesicaria.



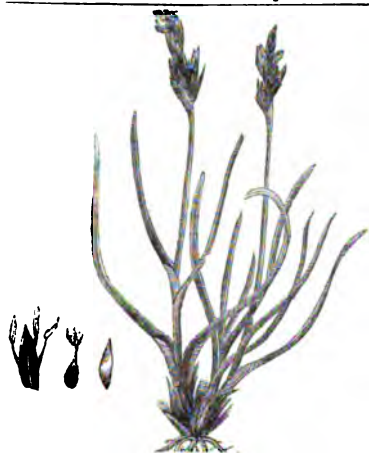
1445

Carex paludosa.



1446

Carex riparia.



1447

Kobresia caricina.



1448

Littorella lacustris.

with a green mid-rib, shorter than the fruit, and dark brown. *Fruit* large, ovate at the base, conical above, smooth, pale green, striated, with a narrow compressed tapering beak, bifid at the apex. *Stigmas* three.

Habitat.—Bogs, the margins of pools, &c.; not very common.

Perennial; flowering in May.

This is nearly allied to the last species, but its leaves are broader, flat, brighter green; the spikelets are not so long, broader, and the fruit is larger, not globose and obtuse at the base of the beak, but ovate at the base, gradually narrowing in a conical manner into the compressed beak.

64. *C. paludo'sa*, Gooden. (Fig. 1445.) *Lesser common Carex*. Barren spikelets two or three, with the lower scales obtuse; fertile two or three, cylindrical, densely flowered, erect, sessile, or pedunculated, the scales lanceolate, acuminate; fruit ovate oblong, compressed, striated, smooth, with a short acuminate bifid beak; bractees leafy, without sheaths; stem acutely angular, rough; root creeping.

English Botany, t. 807.—English Flora, vol. iv. p. 120.—Hooker, British Flora, ed. 4. vol. i. p. 344.—Lindley, Synopsis, p. 291.

Root creeping. *Stem* erect, about two feet high, acutely triangular, and rough, leafy below. *Leaves* broadly linear, with a tapering point, a pale glaucous green, long, rough on the margins and keel, striated, and sheathed at the base. *Bractees* long, leafy, without sheaths. *Barren spikelets* terminal, three or four, oblong, obtuse, its *scales* dark brown, with a green mid-rib, the lower ones always oblong, obtuse, the upper generally so, but sometimes acute, *fertile* spikelets three or four, rather narrow, cylindrical, erect, densely flowered, sessile, or the upper ones mostly sessile, rarely pedunculated, and the lower ones mostly so, the *scales* lanceolate, dark brown, with a green mid-rib, terminating in an acuminate point, sometimes cuspidate. *Fruit* ovate oblong, compressed, green, smooth, numerous and deeply striated, with a short acute beak, more or less bifid, rather longer than the scales. *Stigmas* three.

Habitat.—Banks of rivers and ditches; common.

Perennial; flowering in May.

65. *C. ripar'ia*, Curt. (Fig. 1446.) *Great common Carex*. Barren spikelets three to five, with acuminate scales; fertile three to five, cylindrical, acute, erect, densely flowered, sessile, or pedunculated, the scales lanceolate, or cuspidate; fruit oblong, conical, smooth, slightly striated, with a very short flat deeply bifid beak; bractees very long, leafy, without sheaths; stem acutely angular, rough; root creeping.

English Botany, t. 579.—English Flora, vol. iv. p. 121.—Hooker, British Flora, ed. 4. vol. i. p. 344.—Lindley, Synopsis, p. 291.

Root extensively creeping. *Stem* erect, about three feet high,

stout, acutely angular, and rough, leafy, a rather pale somewhat glaucous green. *Leaves* very long, broadly linear, with a tapering point, numerous striated, somewhat rough on the margins and keel, sheathed, with large cellular partitions. *Barren spikelets* three or four, oblong, crowded at the top of the stem, the *scales* pale brown, lanceolate, acuminate, with a pale mid-rib, *fertile* spikelets three to five, erect, cylindrical, densely flowered, sessile, or the upper sessile, and the lower pedunculated, or all pedunculated, or sessile, *scales* oblong, pale brown, with a broad green mid-rib, terminating in a rough awn between the notches at the apex in a cuspidate manner. *Fruit* oblong, conical, smooth, green, numerous and lightly striated, convex on both sides, the beak short, broad, flat, with two spreading horns. *Stigmas* three.

Habitat.—Sides of pools and ditches; common.

Perennial; flowering in May.

This is the largest of our species, and readily distinguished by its large conical fruit, with its short flat two horned beak and cuspidate scales, and the barren spikelets having narrow acuminate scales. The leaves are used for chair bottoms, matting, &c.

66. *C. hordeifor'mis*, Host. *Barley Carex*. "Sheaths as long as the flower stalk; bractees foliaceous, very long; sterile spikelets about two, remote; fertile oblong, remote, sessile; scales mucronate; fruit oblong, acuminate, striated, rough at the margin, deeply bifid at the point; stem smooth, bluntly angular."—Hooker.

Hooker, British Flora, ed. 4. vol. i. p. 343.—*C. secalina*, Wahl.—English Flora, vol. iv. p. 126.—Lindley, Synopsis, p. 292.

"*Root* apparently creeping, with stout dark brown reddish branched fibres. *Herbage* naked. *Stems* a foot or more high, erect, with three very smooth angles, leafy below. *Leaves* linear, flat, ribbed, rough edged, pointed, rather narrow, not hairy. *Bractees* like the leaves very long, with naked smooth sheaths, from one to two inches in length. *Barren spikelets* two, often solitary, slender, with obovate blunt filmy *scales*, *fertile* spikelets three or four, the uppermost often near together, the lower one or two very remote, all on stalks, concealed by the sheaths of the bractees, erect, short, thick, with ovate acute *scales*, pale and thin at their edges. *Stamens* three. *Stigmas* three. *Fruit* large, ovate, with a thin rough edge, convex, and strongly ribbed externally, without any hairiness, deeply concave at the inner side, being so greatly compressed as to have no considerable cavity, by which character it essentially differs from *C. hirta*, the *beak*, moreover, being longer, narrower, rough at the edges, and somewhat membranous at the orifice. *Seed* obovate, oblong, triangular."—Smith.

Habitat.—In a small valley about three miles west of Panmore, Forfar, Scotland; rare.—Mr. T. Drummond.

Perennial; flowering in June.

This is a very doubtful native species, not very uncommon on the Continent; but we have thought it better to give the above descriptions from Hooker and Smith, rather than to form one from foreign specimens.

GENUS VIII. KOBRESIA.—WILLD. *Kobresia*.

Nat. Ord. CYPERACEÆ. JUSS.

GEN. CHAR. *Spikelets* two flowered, upper ones barren, the lower fertile. *Scales* imbricated, in many rows, single flowered, *barren flowers* of three stamens, without perianth, *fertile flowers* with one style and three stigmas, the ovary embraced with two scales. *Fruit* a somewhat three cornered nut, mucronate, and enclosed in a membranous pouch.

1. *K. caricina*, Willd. (Fig. 1447.) *Compound headed Kobresia*. *Spikelets* aggregate, compound.

English Flora, vol. iv. p. 129.—Lindley, Synopsis, p. 284.—*Schenus monoicus*.—English Botany, t. 1410.—*Elyna*, Schrad.—Hooker, British Flora, ed. 4. v. i. p. 344.—English Flora, v. iv. p. 129.

Root fibrous, tufted. *Stem* erect, simple, from four to eight inches high, angular, striated, rough on the angles upwards, leafy below, and enveloped in numerous old brown sheaths. *Leaves* several, linear, channeled, spreading, shorter than the stem, rough on the edges, and with long close sheaths at the base, crowned with a membranous *ligula*. *Spike* terminal, of several aggregate imbricated spikelets, with short brown membranous sheathing *bractea*. *Scales* oblong, acute, pale brown, with a green mid-rib. *Fruit* linear, ovate, somewhat three cornered.

Habitat.—Moors in wet places; in Durham and Crankley Fell, and about Weddy Bank, in Teesdale Forest, Yorkshire; on Shroine ach-Lochan, Perthshire.

Perennial; flowering in August.

This has the habit of the Carexes, but may, without sufficient examination, be mistaken from its general appearance for a Schœnus.

ORDER IV.

TETRANDRIA. 4 STAMENS.

GENUS IX. LITTORELLA.—LINN. *Shore-weed*.

Nat. Ord. PLANTAGINÆÆ. JUSS.

GEN. CHAR. *Barren flowers* pedicellated. *Calyx* and *corolla* four partite. *Stamens* very long. *Fertile flowers* sessile. *Calyx*

three partite. *Corolla* urceolate, contracted at the mouth, and obsoletely toothed. *Style* long. *Capsule* single seeded.—Name *littus*, the *shore*; in allusion to the situation in which the plant grows.

1. *L. lacus' tris*, Linn. (Fig. 1448.) *Plantain Shore-wood*.

English Botany, t. 468.—English Flora, vol. iv. p. 130.—Hooker, British Flora, ed. 4. vol. i. p. 344.—Lindley, Synopsis, p. 169.

Root long fleshy cord-like fibres, from a fleshy crown, and with several lateral runners. *Leaves* radical, linear, sub-cylindrical, entire, fleshy, slightly channeled above, from two to four inches long, spreading. *Scapes* mostly several, slender, erect, shorter than the leaves, bearing a terminal *barren flower*, having a pale green monophyllous *calyx*, cut into four lanceolate segments, erect, *corolla* pale, thin, membranous, urceolate, with a four-cleft spreading limb. *Stamens* from the bottom of the tube, with long slender *filaments* and rather large ovate two celled yellow *anthers*. *Fertile flowers* sessile at the base of the scapes, inconspicuous. *Calyx* of three lanceolate concave membranous pieces. *Corolla* oblong, tubular, tapering at each end, investing the germen, its mouth somewhat toothed. *Style* long, filiform. *Stigma* at the point of the style. *Capsule* oblong, tapering, single seeded.

Habitat.—Watery places in sandy and stony districts; abundant in the Highland lakes, forming matted tufts.

Perennial; flowering in June.

GENUS X. BUX'US.—LINN. *Box*.

Nat. Ord. EUPHORBIA'CEÆ. JUSS.

GEN. CHAR. *Flowers* clustered, axillary. *Barren flowers* with three partite *calyx*, and a corolla of two pieces. *Rudiments* of a germen, two lobed scales. *Stamens* four, inserted into the rudiments of the germen. *Fertile flowers* with a four partite *calyx*, and a *corolla* of three pieces. *Styles* three. *Stigmas* three, obtuse. *Capsules* with three horns, three celled, each cell two seeded.—Name "altered from *βύξος*, the Greek name for this tree."—Hooker.

1. *B. sempervirens*, Linn. (Fig. 1449.) *Common Box-tree*. Leaves ovate oblong, convex, coriaceous, shining, their stalks slightly hairy; anthers ovate, sagittate.

English Botany, t. 1341.—English Flora, vol. iv. p. 132.—Hooker, British Flora, ed. 4. vol. i. p. 345.—Lindley, Synopsis, p. 223.

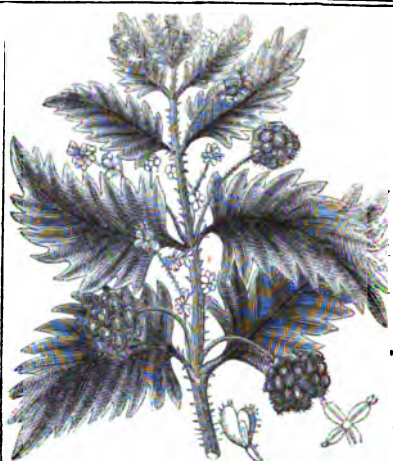
A small tree or shrub, with square green branches, often downy. *Leaves* ovate oblong, often notched at the apex, of a rather thick leathery texture, of a dark smooth shining green above, channeled, with the sunken mid-rib concave and pale beneath, each on a short





1449

Buxus sempervirens.



1450 *Urtica pilulifera.*



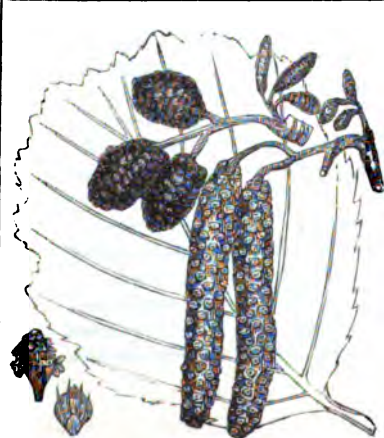
1451

Urtica urens.



1452

Urtica dioica.



1453

Alnus glutinosa.



1454

Xanthium strumarium.

often hairy footstalk. *Inflorescence* globose axillary clusters. *Flowers* crowded, pale yellow. *Petals* variable in number. *Styles* three, short, thick, spreading, persistent. *Stigmas* flat, obtuse. *Capsules* globular, three celled, three valved, and the persistent spreading styles form three horns. *Seeds* two in each cell, erect, oblong, compressed.

Habitat.—Dry chalky hills, principally in the South of England.

Perennial; flowering in April.

The Box is a native of most parts of Europe; in England it has become rather uncommon, from the land being cleared for cultivation; but in many parts of France, Switzerland, and the mountainous districts of Italy, it is very abundant: it is a native also of Asia, Persia, China, and America. The Box is a slow growing tree, and is very valuable as an ornamental evergreen, from the circumstance of its flourishing well under the drip of trees. The wood is hard, compact, smooth, and dense, and is extensively used for the purposes of the turner, mathematical instrument makers, thermometer scales, &c., and is now in very great demand for engraving upon. The art of engraving upon wood has so greatly improved within the last few years, that it seems almost to have created a new era in the illustrations of works, and extended the knowledge of objects of natural history especially, to the attainment of almost every one, so that works which formerly, from the expense of their illustrations, were confined to a limited circulation, are now capable of being published at about one-tenth their original price. The blocks engraved are now much more durable, from the design being cut on the end of the grain, and not parallel with it, as formerly: they are not only more durable, but give better and finer impressions.

Box trees were almost as much esteemed by the Romans for clipping into the various forms of men and animals, &c., as the Yew; but since that style of ornamenting pleasure grounds is now almost abandoned, it is confined to hedges and shrubberies, and a dwarf variety is much used for border edgings, &c.

The branches are used to deck houses and churches at Christmas; and in Italy it is one of the plants most frequently used to strew the churches, and street leading to the church, on days of festivals, or on the anniversary of the patron saint, &c.

As a medicine the leaves have been used in the form of decoction, in the cure of intermittent fevers, cholic, mania, &c., but it is now quite out of use. The leaves do not appear to be eaten by any animals, and Gmelin says that they are fatal to the camels that eat them. The property of these leaves seems to reside in an alkaline principle, obtained by Fauré, by digesting the bark of the tree in alcohol, which is evaporated, and the residue dissolved in water and boiled with a solution of ammonia. The precipitate thus obtained is digested in alcohol and evaporated, and the *Buxina* is left in a dark brown translucent mass.

GENUS XI. URTICA.—LINN. *Nettle*.

Nat. Ord. URTICÆ. JUSS.

GEN. CHAR. *Barren flowers* in loose racemes, *perianth* single, four partite. *Stamens* four, curved inwards before the anthers are matured. *Fertile flowers* in capitate racemes, *perianth* single, of two pieces. *Stigma* single. *Fruit* single seeded, surrounded with the perianth.—Name from *uro*, to burn; in allusion to the burning sensation its stings produce.

1. *U. pilulifera*, Linn. (Fig. 1450.) *Roman Nettle*. Leaves opposite, ovate, acuminate, deeply serrated; ribs transverse; fertile flowers in globular heads.

English Botany, t. 148.—English Flora, vol. iv. p. 134.—Hooker, British Flora, ed. 4. vol. i. p. 345.—Lindley, Synopsis, p. 219.

Root fibrous. *Stem* erect, about two feet high, branched, obtusely four angled, often purplish, leafy, and copiously furnished with venomous hairs. *Leaves* opposite, petiolated, ovate, acuminate, somewhat heart-shaped at the base, deeply inciso-serrated, a greyish green above, paler beneath the mid-rib, and transverse lateral ribs distinct. *Stipules* ovate. *Inflorescence* axillary, the *barren flowers* in loose branched spreading paniculated racemes, *perianth* in four ovate hairy segments, *fertile flowers* in globose clusters, about the size of a marble, elevated on a short peduncle, the *perianth* of two oblong hairy pieces. *Seed* ovate, compressed, smooth brown.

Habitat.—Under walls and amongst rubbish, especially near the sea. Norfolk, Suffolk; Ballylickery, South of Ireland.

Annual; flowering in June and July.

The *U. Dodartii*, Linn., is found along the east coast of England, and is distinguished by its nearly entire ovate lanceolate leaves, the stipules being lanceolate; the fruit is smooth, and the flowers are in globose stalked clusters. It, perhaps, has as much right to a place in our Flora as the proceeding, as both are naturalized plants, and not originally natives.

2. *U. wrens*, Linn. (Fig. 1451.) *Small Nettle*. Leaves opposite, deeply serrated, ovate, acute, with about five parallel ribs; clusters of flowers nearly simple, shorter than the petioles.

English Botany, t. 1236.—English Flora, vol. iv. p. 134.—Hooker, British Flora, ed. 4. vol. i. p. 345.—Lindley, Synopsis, p. 219.

Root fibrous. *Stem* erect, about a foot high, obtusely angular, branched, leafy, often purplish. *Leaves* opposite, ovate, acute, deeply cut into large often serrate teeth, a bright green, paler beneath, furnished with numerous venomous hairs, a prominent mid-rib and lateral parallel ribs. *Inflorescences* axillary, in simple racemose clusters, mostly shorter than the leaf stalks. *Perianth* of ovate

concave pieces, more or less hairy. *Seed* ovate, compressed, pale brown, polished.

Habitat.—Waste and cultivated ground; very common.

Annual; flowering from June to October.

A very variable plant in size, according to the situation and kind of soil in which it grows.

8. *U. dioica*, Linn. (Fig. 1452.) *Great Nettle*. Leaves opposite, oblong, heart-shaped, coarsely serrated; panicles axillary, much branched, longer than the petioles, mostly diœcious.

English Botany, t. 1750.—English Flora, vol. iv. p. 135.—Hooker, British Flora, ed. 4. vol. i. p. 135.—Lindley, Synopsis, p. 219.

Root long, creeping, and with deep fibrous branches. *Stem* erect, about three feet high, obtusely four angled and furrowed, mostly a dull purple, simple or branched, leafy, and very hairy. *Leaves* large, rough, opposite, spreading, oblong, heart-shaped, with a more or less tapering point, coarsely serrated, with large often compound teeth, a deep dull green, paler beneath the mid-rib, and spreading lateral branches prominent. *Inflorescence* axillary much branched spreading paniculated racemes, longer than the leaf stalks, the *perianth* of ovate concave hairy pieces. *Fruit* ovate, acute, compressed.

Habitat.—Waste places, under hedges and walls; frequent.

Perennial; flowering in July and August.

The Nettles are well known as troublesome weeds in gardens, hedges, &c., and almost every Rambler in the fields or incautious gardener is acquainted with the effect of their poisonous weapons. The rigid hairs with which they are furnished, when examined with a magnifying power, will be found all of a tubular form, tapering to a fine open point, the base being dilated into an oblong receptacle, having at the bottom a gland embedded in the cellular substance of the leaf. This gland secretes an acrid juice, and is retained in the receptacle; thus furnished, when any obtrusive hand is applied to the point, it readily enters the skin, and the pressure forces the fluid along the tube into the wound it has made. This remarkable contrivance is very similar to the structure of the poisonous fangs of the rattle-snake, viper, &c., and differs from the sting of the wasp in being open at the apex, while that of the wasp has the opening below the point, so that this little insect is ever furnished with a ready weapon, which is less liable to become deranged from repeated use by the point being more acute; and the opening being on one side below, it is less liable to become obstructed, a contrivance admirably adapted in each case or the uses for which the arms are required.

The painful swellings and inflammations caused by the sting of our common Nettles in some persons is very considerable; but it is nothing in comparison with that produced by some of the Indian species. M. Leschenault Mem. Mus. 6. 362. gives the following

description of the sting of the *Urtica crenulata*, from gathering a specimen in the Botanical Garden, at Calcutta :—" One of the leaves slightly touched the first three fingers of my left hand : at the time I only perceived a slight pricking, to which I paid no attention. This was at seven in the morning. The pain continued to increase ; in an hour it had become intolerable ; it seemed as if some one was rubbing my fingers with a hot iron, nevertheless, there was no remarkable appearance ; neither swelling, nor pustule, nor inflammation. The pain rapidly spread along the arm as far as the arm-pit. I was then seized with frequent sneezing, and with a copious running at the nose, as if I had caught a violent cold in the head. About noon, I experienced a painful contraction at the back of the jaws, which made me fear an attack of Tetanus. I then went to bed, hoping that repose would alleviate my sufferings ; but it did not abate ; on the contrary, it continued during nearly the whole of the following night ; but I lost the contraction of the jaws about seven in the evening. The next morning the pain began to leave me, and I fell asleep. I continued to suffer for two days ; and the pain returned in full force when I put my hand in water. I did not finally loose it for nine days." Another dangerous species is mentioned by the same Botanist, which he found at Java, *U. stimulans* ; but the most virulent of any other is that of the Devil's leaf, *davum setan*, a native of Timor ; its effects are said by the natives to last for a year, and even to cause death.

The tops of the young common Nettles are gathered in the spring in many parts of the country, and made into porridge, and is a popular remedy for the cure of scurvy, or other eruptions on the skin. It seems also to have been cultivated as a culinary vegetable, especially in Scotland. The roots of *U. dioica*, boiled with alum, dyes yarn of a yellow colour, and the stems are prepared and furnish a strong fibrous substance, the same as Hemp. The larva of numerous insects feed upon the leaves, and the plants do not flourish unless nitrate of potass is a component part of the soil.

GENUS XII. AL'NUS.—TOURN. *Alder*.

Nat. Ord. BETULIN'Æ. RICH.

GEN. CHAR. *Flowers* in imbricated *catkins*. *Barren flowers* elongated, cylindrical catkins, with cordate scales, pedicellated, and with three small scales beneath them, bearing stamens from the base. *Perianth* single, four partite. *Fertile flowers* roundish ovate catkins, the scales sub-trifid, two flowered, coriaceous, and persistent. *Perianth* wanting. *Stigmas* two. *Fruit* compressed, ovate, two celled, each cell two seeded.—Name derived from the Celtic words *al*, *near*, and *lan*, the *river-bank*.

1. *A. glutinosa*, Gart. (Fig. 1453.) *Common Alder*. Leaves roundish, wedge-shaped, obtuse, the margin lobed and serrated, somewhat glutinous, the axis of the ribs with tufts of hairs.

English Flora, vol 4. p. 131.—Hooker, British Flora, ed. 4. vol. i. p. 345.—Lindley, Synopsis, p. 229.—*Betula alnus*, Linn.—English Botany, t. 1508.

A tree of slow growth, varying in height from twenty to sixty feet and upwards, with rugged bark, round crooked branches, angular and glutinous when young. *Leaves* alternate, petiolated, of a dark shining green above, pale beneath, roundish, with a wedge-shaped base, obtuse, often notched at the end, more or less lobed and serrated on the margin, the mid-rib and lateral veins prominent, with a tuft of hairs at the angles. *Stipules* roundish, entire, soon falling away. *Barren catkins* long, cylindrical, pendulous, the *fertile* roundish ovate, like a small cone, persistent, mostly in threes, on short branches. *Fruit* ovate, compressed, brown, smooth, shining.

Habitat.—Wet meadows, the borders of lakes, rivers, and pools; frequent.

Tree; flowering in March.

A common well known tree, of very variable size; in some situations only a low shrub, but mostly a low tree, and in situations suited to its growth where it has been allowed to grow unmolested it attains the height of about sixty feet. Varieties are occasionally found having the leaves edged with light green, which is the var. *emarginata*, of Willd., and sometimes the leaves are cut in a pinnatifid manner, and it is then the var. *laciniata* of the same author.

The wood of the Alder, though soft, is applied to a variety of purposes; when first cut down it is white, but soon becomes of a brown colour, which it ever after retains, and is made into a variety of useful articles, from its being soft, light, and durable, and little liable to warp; it is made into sabots, soles for shoes, pattens, clogs, &c.; it is sometimes used for making articles of furniture, &c. After it has lain in peat bogs it becomes black as ebony, but will not take the durable polish of that wood. It appears to form the best kind of wood piles for bridges, &c., remaining undecayed for a very considerable period under water. Though of such very short duration when exposed to the air, under cover it appears to be so durable, that in Dorsetshire, the adage applied to willow and poplar poles, in the Midland Counties is applied to the Alder—

“Thatch me well, and keep me dry,
Heart of Oak I will defy.”

The wood burns but slowly, and consequently is not in much request for domestic fuel; but for lime or brick kilns it is excellent, and for burning into charcoal for making gunpowder it is the best wood known. The bark contains a considerable portion of tanning matter:

that of the young branches is used for tanning: it is also employed in-dying red, brown, and yellow, and with sulphates of iron black. As the branches increase in size the bark cracks, as alluded to in the following lines by Virgil:—

“As Alders in the spring their boles extend,
And heave so fiercely that the bark they rend.”

They contain less tanning matter, or rather it is less soluble. The flowers and buds possess the same properties, and are applied to similar uses, and the leaves are sometimes used for their astringent properties in decoctions, as well as gargles for relaxed throats.

As an ornamental tree little can be said for it, and it is scarcely or never planted in pleasure and ornamental grounds. It, however, affords in its own wild luxuriance a character somewhat peculiar to the country, giving to the river banks of the mountain or moor land scenery a dark melancholy appearance. In the following lines it is asserted by Virgil to be the trees into which the sisters of Heliades were turned by the gods for their affliction at the death of their brother Phæton on the banks of the river Po.

“The sisters mourning for their Brother’s loss,
Their bodies hid with bark and furr’d with moss,
How each in rising *Alder* now appears,
And o’er the Po distils her gummy tears.”

The slender roots are split and worked in some parts of France into baskets, the larger ones for ornamental cabinet work. The leaves furnish food to the larva of numerous insects, and though eaten by horses, cows, goats, and sheep, it does not appear to be a favourite food with them.

The Alder is remarkable as flourishing not only near, but we may almost say in water the best of any of our native trees. It is commonly distributed throughout the whole of Europe, but in the more northern parts it is diminished to a low shrub. It is found in the northern parts of Asia and Africa, and is also a native of North America, and not uncommon in the interior and on the North-west coast of Canada.

ORDER V.

PENTAN'DRIA. 5 STAMENS.

GENUS XIII. XAN'THIUM.—LINN. *Bur-weed.*

Nat. Ord. COMPOSITÆ. JUSS.

GEN. CHAR. *Barren flowers* several globose terminal heads, each head surrounded by an *involucre*, of a single row of scales, the

receptacle paleaceous, *florets* numerous, each a single clavate *perianth*, with five short lobes, containing numerous *stamens* and two abortive stigmas. *Fertile flowers* two, inclosed in a single prickly *involucre*, with two beaks, *perianth* wanting. *Stigmas* two, protruding through the small apertures within the beak. *Fruit* compressed, each occupying a cell within the hardened involucre.—Name from *ξαρός*, *yellow*; in allusion to the yellow colour of the infusion of the plant, which is asserted by Dioscorides to be communicated to the hair.

1. *X. strumarium*, Linn. (Fig. 1454.) *Broad leaved Bur-weed*. Stem unarmed, the lower leaves heart-shaped, three lobed, and toothed; fruit with a straight beak; prickles of the involucre hooked. English Botany, t. 2544.—English Flora, vol. iv. p. 136.—Hooker, British Flora, ed. 4. vol. i. p. 346.—Lindley, Synopsis, p. 151.

Root fibrous. *Stem* erect, branched, from one to two feet high, furrowed, downy, leafy. *Leaves* downy, heart-shaped, three lobed, toothed, and serrated, a pale rather sickly looking green, paler beneath, elevated on a rather long footstalk, three branched at the base of the leaf. *Inflorescence* axillary and terminal. *Barren flowers* in dense globose clusters, several on a common stalk, the *perianth* green, nearly sessile, tubular or club-shaped, erect, containing five *stamens*, with rather large *anthers*. *Fertile flowers* mostly several, all nearly sessile, *involucre* united to the germens, except towards the top. *Fruit* of two cells, each cell single seeded.

Habitat.—Waste places about dunghills in the South of England, and about Kerry, Ireland; but rare.

Annual; flowering in August and September.

This is a doubtful native plant, but has become naturalised. The genus is not remarkable for any useful properties that they possess, but are curious as being allied to or doubtful plants of the same Order Compositæ. Their most obvious difference is in the stamens and pistils being in separate flowers, but otherwise its affinity to Compositæ is such as to be united with them by many Botanists, though they form the Order *Ambrosiaceæ*, Link.; and Dr. Koch follows his arrangement. It is a frequent plant on the Continent, and in Italy *X. spinosum*, Linn., is common on the road sides almost everywhere. It is readily known by its entire three lobed leaves and the trifid spines with which it is armed.

GENUS XIV. AMARANTHUS.—LINN. *Amaranth*.

Nat. Ord. AMARANTHACEÆ. JUSS.

GEN. CHAR. *Barren flowers* with a single *perianth*, deeply three or five-cleft. *Stamens* three to five. *Fertile flowers* with the

perianth deeply three or five-cleft. *Styles* three. *Fruit* a one celled single seeded capsule, crowned by the persistent style, and opening all round by a transverse incision.—Name from α , *not* ; and $\mu\alpha\epsilon\alpha\iota\nu\alpha$, to *fade*, or wither ; in allusion to the bright colour of many of the species remaining after being dried.

1. *A. Blitum*, Linn. (Fig. 1455.) *Wild Amaranth*. Flowers in small axillary clusters and a small terminal naked spike ; perianth three partite, triandrous ; stem spreading, smooth ; leaves ovate, obtuse ; bractea short ; capsule roundish, ovate.

English Botany, t. 2212.—English Flora, vol. iv. p. 137.—Hooker, British Flora, ed. 4. vol. i. p. 346.—Lindley, Synopsis, p. 213.

Root tapering. *Stems* several, smooth, furrowed, mostly of a pinkish hue, spreading, ascending, branched at the base, and leafy. *Leaves* on rather long footstalks, ovate, obtuse, sometimes notched at the apex, and roughish on the margins, bright green, paler beneath. *Flowers* small, pale green, sessile, the *perianth* three partite, with a pale membranous margin, the *barren* one with three *stamens*, the *filaments* short, and *anthers* oblong, yellow. *Capsule* roundish ovate, longer than the perianth, crowned by the persistent styles, single seeded, bursting all round. *Seed* sub-globose, almost black, smooth shining.

Habitat.—Waste ground, especially about dunghills. Cambridge shire ; about London, and in Huntingdonshire ; rare.

Annual ; flowering in August.

This, a small green unobtrusive plant, is a doubtful native, and opposite in character to that of many of the other species, well known as garden flowers, such as the *Prince's Feather*, *A. hypochondriacus* ; *Love Lies Bleeding*, *A. caudatus* ; and the *Melancholy Flower*, *A. melancholicus*, &c., and the *Gomphrena globosa*, a well known garden flower of the "Everlasting" kind is nearly allied to the genus.

A. Blitum is used as a pot-herb in some parts of France, and it is probable that the leaves of most of the species might be eaten the same as spinach.

GENUS XV. BRYONIA.—LINN. *Bryony*.

Nat. Ord. CUCURBITACEÆ. Juss.

GEN. CHAR. *Barren flowers* with a [five toothed *calyx*, a five-cleft *corolla* and *stamens* in three parcels. *Fertile flowers*, *calyx* five toothed, *corolla* five-cleft. *Styles* three-cleft. *Fruit* an inferior *berry*, globose. *Seeds* small, ovate, compressed, more or less bordered.—Name from $\beta\rho\upsilon\nu$, to shoot, or grow rapidly ; in allusion to the quick growth of the branches.

1. *B. dioica*, Jacq. (Fig. 1456.) *Red berried Bryony*. Leaves cordate, five lobed, the teeth with callous points ; flowers sub-corym-



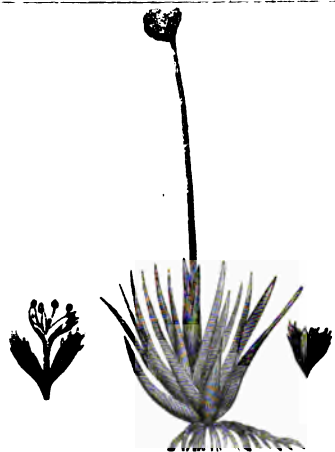
1455

Amaranthus blitum.



1456

Bryonia dioica.



1457

Eriogonum septangulare.



1458

Ceratophyllum demersum.



1459

Ceratophyllum submersum.



1460

Poterium sanguisorba.



bose, dioecious; calyx of the fertile flowers much shorter than the corolla.

English Botany, t. 439.—English Flora, vol. iv. p. 138.—Hooker. British Flora, ed 4. vol. i. p. 346.—Lindley, Synopsis, p. 326.—*B. alba*, Hudson.

Root large, fleshy, white, very acrid. *Stem* herbaceous, weak, round, roughish, branched, leafy, climbing by the long and simple axillary *tendrils* several feet. *Leaves* alternate, petiolated, large, from three to four inches wide, more or less deeply heart-shaped at the base, five lobed and toothed, the teeth terminating in a small hardened point, dark green, paler beneath, and rough on both sides, with short rigid hairs, dilated at the base. *Inflorescence* axillary sub-corymbose clusters, of from four to eight flowers, elevated on a common stalk, longer than the petioles. *Calyx* of one piece, deeply five-cleft, about half as long as the *corolla*, which is formed of five oblong spreading lobes, pale green, elegantly veined. *Style* cleft into three or four lobed downy *stigmas*. *Fruit* an inferior globose scarlet *berry*, of three cells, each cell two or more seeded.

Habitat.—Hedges and thickets; frequent in England, “not indigenous to Scotland.”—*Hooker*.

Perennial; flowering in May.

The tubers of this plant are often very large. “Old Gerarde,” in speaking of this plant, says, “The Queene’s chiefe chirurgeon, Master William Goodorous, shewed me a roote hereof that waied halfe an hundred waighte, and the bignesse of a childe a yeare old.” The fresh root, when taken into the stomach, acts as a violent emetic and purgative, and has been used as a diuretic in dropsical affections. The taste is nauseous, very acrid, and bitter, properties which seem to depend upon the presence of a peculiar substance, named by its discoverer Vauquelin, *Bryonite*. The fresh root, when applied to the skin, is so acrid, that it raises a blister if kept on the part too long; on account of this property it is sold in the shops for the purpose of applying to swellings about the eyes and face, caused by blows, &c., in the same manner as that of *Convallaria multiflora*. The roots cut into slices have been often used to mix with those of *Colomba*, an unpardonable adulteration, from which the most serious consequences might arise. Bryony is a most drastic purgative, while the *Colomba* root is a mild elegant tonic. It is often also used to adulterate Jalap, but here the fraud is not so vile, as both possess similar properties, but that of Jalap is less drastic and irritating. Withering says that a decoction of the fresh root of Bryony is one of the best cathartic medicines for horned cattle, and that it is a common practice in Norfolk to give small quantities to horses, mixed with their corn, to render their coats glossy and fine. Goats are said to be the only animals that will feed upon this plant. It is very common on the Continent, as well as *B. alba*, which is distinguished by the segment of the calyx being as long as the corolla, and the berries being black.

ORDER VI.

HEXAND'RIA. 6 STAMENS.

GENUS XVI. ERIOCAULON.—LINN. *Pipewort.*

Nat. Ord. RESTIACEÆ. JUSS.

GEN. CHAR. *Flowers* collected into a compact scaly head, each scale single flowered, except the outer ones, which are barren, and forming an involucre. *Barren flowers* in the centre perianth single, unequally four to six cleft. *Stamens* four to six. *Fertile flowers* in the ray, perianth single, deeply four-partite. *Style* one. *Stigmas* two or three. *Capsules* two or three lobed, two or three celled, each cell single seeded.—Name from *ερειον*, wool; and *καυλος*, the stem; in allusion to the downy stem or scapes of some of the species.

1. *E. septangulare*, With. (Fig. 1457.) *Jointed Pipe-wort.* Scape erect, striated, sheathed at the base; leaves subulate, compressed, smooth, shorter than the scape; flowers four-cleft, hairy at the extremities, as well as the scales; stamens four; capsule two celled.

English Botany, t. 733.—English Flora, vol. iv. p. 139.—Hooker, British Flora, ed. 4. vol. i. p. 346.—Lindley, Synopsis, p. 272.

Root with creeping stems, and long white radicles, pellucid, and curiously jointed, with numerous transverse partitions. *Leaves* radical, from one to three inches long, beautifully cellular, numerous, smooth, awl-shaped, with a rather broad base, channeled. *Scape* solitary, four to six inches long, erect, cellular, enveloped at the base with a tubular sheath, striated, with about seven angles, smooth, naked above, and terminating in a small roundish dense head of compact flowers, white, with a purplish hue. *Flowers* "each with an obovate membranous concave scale, nearly as long as itself. Two outer segments of the perianth duplicato-carinate, purplish, two inner white, of the central sterile flowers united for a great proportion of the length, so as to be two lipped at the extremity, each lip bearing a stamen, and above that a black sessile gland, and on each side between the two lips a stamen, in the centre between these are two black stalked glands (abortive styles?). In the fertile flowers the four segments are almost equally divided to their base, the inner having a black sessile gland at the extremity. Pistil shortly stipitate. Germen of two globose lobes. Style short. Stigmas two, long, subulate."

Habitat.—Lakes in mountainous countries; rare. In Skye, Coll, and a few of the neighbouring islands of the Hebrides. Cunnamare, North-west of Ireland; frequent.

Perennial; flowering in August.

This curious little plant grows in crowded tufts, and frequently becomes detached from its long roots, forming small floating islands. The description above given of the flowers is that of Sir W. J. Hooker, who has paid particular attention to this remarkably curious genus of plants. The leaves and scape are extremely beautiful when seen by a magnifying power, and is a beautiful example of the mucronated cellular structure.

ORDER VII.

POLYANDRIA. MANY STAMENS.

GENUS XVII. CERATOPHYLLUM.—LINN. *Horn-wort*.

Nat. Ord. CERATOPHYLLÆ. GREY.

GEN. CHAR. *Barren flowers* with an inferior many partite *perianth*.

Stamens sixteen to twenty. *Fertile flowers* with a many partite *perianth*. *Ovary* superior. *Style* filiform, curved, simple. *Fruit* a one celled *nut*, with a pendulous seed.—Name from *κερας*, *κερατος*, a *horn*; and *φυλλον*, a *leaf*; in allusion to the forked leaves.

2. *C. demersum*, Linn. (Fig. 1458.) *Common Horn-wort*. Leaves whorled, with bristle-shaped segments; fruit armed with two spines near the base, and terminated by the curved subulate style.

English Botany, t. 947.—English Flora, vol. iv. p. 141.—Hooker, British Flora, ed. 4. vol. i. p. 347.—Lindley, Synopsis, p. 225.

Root fibrous, the whole plant a dark green, growing entirely under water. *Leaves* about eight in a whorl, densely crowded, cut into dichotomous slender awl-shaped segments, more or less toothed on the margin. *Flowers* all axillary, sessile, with a thin white erect membranous *perianth*, more or less deeply cut into segments. *Stamens* with erect oblong spotted two celled anthers, about twenty. *Fruit* ovate, green, armed towards the base on each side with a projecting horn, of greater or less length, and crowned with the curved slender awl-shaped style.

Habitat.—Slow running streams and ditches; frequent.

Perennial; flowering in July.

2. *C. submersum*, Linn. (Fig. 1459.) *Spiked Water Milfoil*. Leaves whorled, with bristle-shaped segments; fruit without spines at the base, and terminated by the short mucronate style.

English Botany, t. 679.—English Flora, vol. iv. p. 142.—Hooker, British Flora, ed. 4. vol. i. p. 347.—Lindley, Synopsis, p. 225.

This is very similar to the last species. The *leaves* are, perhaps, in more distant whorls, with entire scarcely even toothed segments, and

the *fruit*, by which it is best distinguished as a species, is without or only with the rudiments of spines near the base, and the *style* is short, mucronate, slightly curved.

Habitat.—Ditches in the East and Southern parts of England.

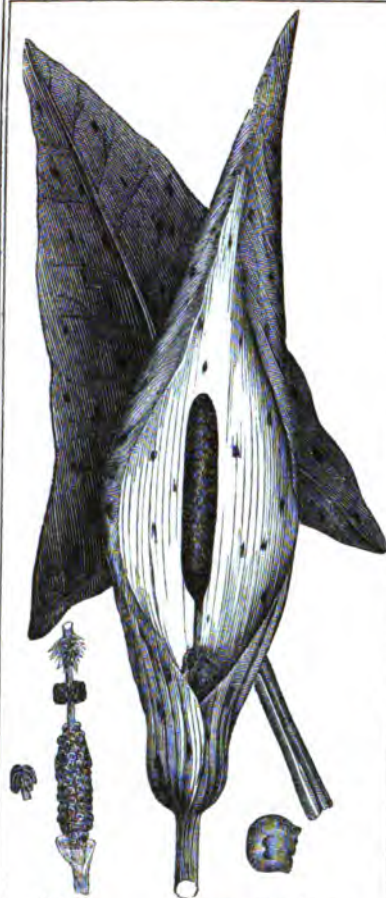
Perennial; flowering in September.

These humble looking plants, like many other of the aquatic vegetables, are not known to possess any particular virtues as food or medicine; but they are, nevertheless, of great utility. The roots growing in the decaying remains of plants in the bottom of the water in which they are submersed, absorb abundantly the carbonic acid gas as it is formed by these decaying vegetable matters. Carbonic acid gas is composed of one atom or one part of oxygen, and one atom of carbon, united together; this, as it is circulated through the plant, is decomposed by the light, aided probably by the vital action of the plant itself. The carbon is applied to the formation of the structure of the plant, and the oxygen gas is set free, and escapes through the pores or stomata of the cuticle. The gas thus set free often accumulates amongst the matted stems and leaves of aquatic plants, and if they are agitated by a stick, it is seen to escape in large bubbles through the water into the air, and becomes a component part of the atmosphere, and assists in supplying the animal creation with gas so necessary for their existence. Thus we find that these humble denizens of our ditches and pools perform not only when living, but by their decay when dead, a most important office in the harmony of the creation. A very simple experiment will prove the separation of oxygen gas from water containing carbonic acid gas in solution. Take a glass globe or receiver, filled with water containing carbonic acid gas in solution, put into it a branch of mint, or any other plant fastened by its stem to a plate with a little wax and thread, invert the glass full of the water, and place them in the rays of the sun, and it will shortly be seen that bubbles of gas escape from the leaves and pass to the top of the glass: this gas will be found to be oxygen; and as long as there is any carbonic acid gas in the water this process goes on; but in water not containing any carbonic acid in solution no change takes place in the plant, nor does any gas pass from its leaves.

GENUS XVIII. A'RUM.—LINN. *Cuckow-pint*.

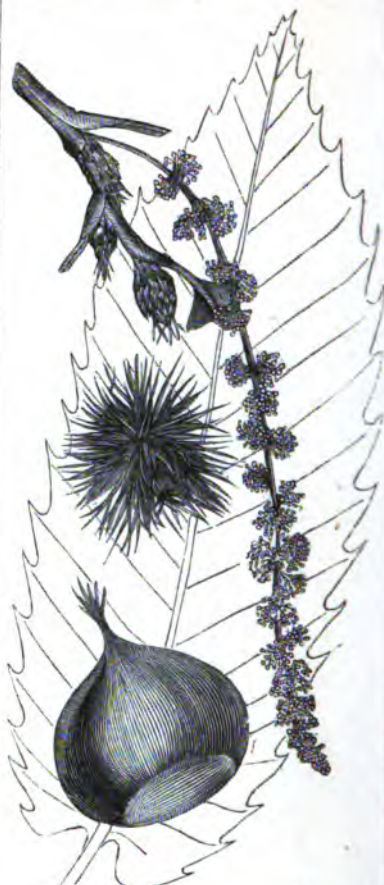
Nat. Ord. ARO'IDÆ. JUSS.

GEN. CHAR. *Spatha* of one leaf, convolute at the base, and enclosing a *spadix*. *Spadix* with the ovaries inserted at the base, about the middle are numerous rows of sessile *anthers*, and above it is naked. *Fruit* a *berry*, one celled, many seeded.—Name formerly written *aron*, supposed to be an ancient Egyptian word, by which the *A. colocasia* was known.



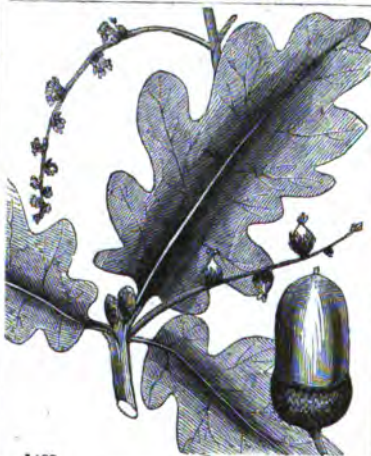
1461

Arum maculatum.



1462

Castanea vulgaris.



1463

Quercus Robur.



1464

Quercus sessiliflora.

1. *A. maculatum*, Linn. (Fig. 1461.) *Cuckow-pint*, or *Wake-robin*. Leaves radical, hastato-sagittate: lobes deflexed; spadix club-shaped, obtuse, shorter than the spatha.

English Botany, t. 1298.—English Flora, vol. iv. p. 146.—Hooker, British Flora, ed. 4 vol. i. p. 347.—Lindley, Synopsis, p. 246.

Root fibrous, with a large fleshy tuberous underground stem, mucilaginous and acrid. *Leaves* large, bright green, often spotted with dark purple, paler beneath, hastate, with sagittate lobes at the base, deflexed, the footstalk channeled, and sheathing at the base. *Scape* round, smooth, erect, terminating in a large membranous pale green convolute *spatha*, often spotted, and enveloping a *spadix*, which is shorter than the spatha, naked, club-shaped and purple above, at the base are inserted several circles of *ovaries*, above these are several circles of sessile two celled *anthers*, and over these are one or two rows of apparently abortive ovaries. *Fruit* a bright scarlet *berry*, remaining in an oblong crowded spike, after the leaves and spadix have decayed, each berry one celled, and many seeded.

Habitat.—Groves and hedges; frequent in England, rare in Scotland and Ireland.

Perennial; flowering in April and May.

The plants of the Natural Order Aroidæ, to which our Arum belongs, are remarkable for the property which they possess of being acrid and pungent in a fresh state, but when deprived of their juices are wholesome, and applicable as food. One of the most remarkable is the Dumb Cane, *Caladium seguinum*, a native of the West Indies and South America. Sir W. J. Hooker, in Exot. Bot. 1. gives an account of a gardener who incautiously bit a piece off the Dumb Cane, when his tongue swelled to such a degree that he could not move it; he became utterly incapable of speaking, and was confined to the house for some days in the most excruciating torments. The same author also states that it is said to impart an indelible stain to linen. The fleshy underground stems possess similar properties in most of the species in a greater or less degree, as well as the leaves; yet when cooked they may be used as harmless food. The tubers of the *A. maculatum* are used in the Island of Portland, and about Weymouth, where the plant grows in great abundance: prepared by maceration, powdering and washing away the juice, the residue is a wholesome and nutritive article of food, sold under the name of Portland Sago. *A. Dracunculus*, a native of the South of Europe, is remarkable from the stalks of the leaves being spotted like the belly of some snakes; while the singular looking flower has the smell of carrion, being extremely disagreeable and fetid.

GENUS XIX. POTE'RIUM.—LINN. *Salad-Burnet*.

Nat. Ord. ROSACEÆ. JUSS.

GEN. CHAR. *Flowers* collected into dense heads, with three or four scaly bracteas at the base of each. *Barren flowers* with a four-cleft *perianth*. *Stamens* thirty to forty, with long slender *filaments*. *Fertile flowers* with a tubular perianth, contracted at the mouth, with four deciduous teeth. *Styles* two, filiform. *Stigmas* tufted. *Fruit* two, one seeded, *nuts* invested with the hardened four angled tube of the perianth.—Name from *poterium*, a *drinking cup*; said to be so called from the plant being used as one of the ingredients in the drink called *Cool-tankard*.

1. *P. Sanguisor'bia*, Linn. (Fig. 1460.) *Common Salad-Burnet*. Herbaceous; stem somewhat angular; fruit hardened, reticulated, quadrangular.

English Botany, t. 860.—English Flora, vol. iv. p. 147.—Hooker, British Flora, ed. 4. vol. i. p. 348.—Lindley, Synopsis, p. 103.

Root woody. *Stem* herbaceous, erect, branched, angular, striated, smooth above, downy below, leafy, from one to two feet high. *Leaves* pinnated, with several pairs of roundish ovate neatly and deeply serrated leaflets, and an odd terminal one, a deep somewhat glaucous green above, paler beneath. *Stipules* in pairs at the base of the leaf, deeply cut, rather small. *Inflorescence* terminal globose heads of crowded flowers, the upper ones *fertile*, with a tubular perianth, contracted at the mouth, the limb of four spreading obtuse teeth, the *style* long, filiform, terminating in a tufted *stigma*, purple, *barren flowers* below, with a four-cleft perianth, having a very short tube, the *stamens* crimson, numerous, with long *filaments* and ovate yellow *anthers*, of two cells. *Fruit* one or two *nuts*, closely invested with the persistent tube of the perianth, which becomes hardened, angular, and reticulated.

Habitat.—Dry hills and pastures; common.

Perennial; flowering in June and July.

The common Burnet has been cultivated for fodder in dry chalky lands; but since *Saintfoi* has become more known, it, from its producing a greater abundance of fodder has superseded it. The leaves have the smell and somewhat the taste of cucumber, for which reason it often forms a part of the ingredients of a spring salad, and is commonly cultivated for that purpose in many parts of the Continent. The famous old English drink, called *Cool-tankard*, owed part of its flavour and virtue to this plant, and on this account it is said to have been called *Poterium*. The properties of this plant are similar to that of *Sanguisor'bia officinalis*, vol. i. p. 203, for which it is in differently cultivated and used.

GENUS XX. QUERCUS.—LINN. *Oak*.

Nat. Ord. CUPULIFERÆ. RICHD.

GEN. CHAR. *Barren flowers* in lax pendulous catkins. *Perianth* single, lacerated. *Stamens* five to ten. *Fertile flowers* with an involucre, of numerous small scales, united into a cup, *perianth* single, closely investing and adhering to the ovary, six toothed. *Ovary* three celled, two of the cells abortive. *Stigmas* three. *Fruit* (acorn) one celled, single seeded, surrounded at the base by the cup-shaped involucre.—Name from the Celtic *quer*, *beautiful*; and *cuez*, a *tree*. As it produced the Misseltoe of the Druids, it was called *derw*; hence *Darach*, Gallic; *δρυς*, in Greek, and *Dryades*.

1. *Q. Robur*, Linn. (Fig. 1463.) *Common British Oak*. Leaves shortly pedunculated, or sub-sessile, deciduous, oblongo-obovate, deeply sinuated, the lobes roundish, obtuse, smooth; fruit two or three, sessile, upon long peduncles.

English Botany, t. 1442.—English Flora, vol. iv. p. 148.—Hooker, British Flora, ed. 4. vol. i. p. 348.—Lindley, Synopsis, p. 240.—*Q. pedunculata*, Willd.

A *tree*, the largest and most handsome of our forests, the trunk clothed with thick rough cracked bark, and the branches with round smooth bark, leafy. *Leaves* alternate, smooth, a full bright green, with short footstalks, or sessile, oblong, obovate, more or less deeply emarginated at the base, unequally sinuated with deep somewhat acute sinuses and obtuse lobes, mid-rib prominent, with a lateral branch to each lobe, paler green beneath. *Barren flowers* in small lax clusters, on a slender peduncle, about two inches long, pendulous, and mostly several from lateral scaly buds, downy. *Fertile flowers* two or three, sessile, upon peduncles, from one to two inches long, spreading, downy when young, the *involucre* brown, of many united scales, forming the hardened cup of the fruit. *Fruit* an acorn, ovate, oblong, smooth, polished, single celled, single seeded, surrounded at the base by the hardened cup.

Habitat.—Woods and hedges; everywhere.

Tree; flowering in April and May.

2. *Q. sessiliflora*, Salisb. (Fig. 1464.) *Sessile fruited Oak*. Leaves pedunculated, deciduous, oblong or obovate, deeply sinuated, the lobes obtuse, smooth; fruit clustered, sessile, or on very short stalks.

English Botany, t. 1845.—English Flora, vol. iv. p. 150.—Hooker, British Flora, ed. 4. vol. i. p. 348.—Lindley, Synopsis, p. 240.—*Q. Robur*, Willd. Huds.

A *tree*, similar in appearance to that of the last species; the difference is that in this the *leaves* have longer footstalk, and when young more downy beneath, and of a rather paler green. The *barren*

the vintage is come down." And we are told in Isaiah lxiv. that cedars, cypress, and *Oak*, where hewn down, and made into graven images: "And none considered in his heart, neither is their knowledge and understanding to say, I have burned part of it in the fire; yea, also I have baked bread upon the coals thereof; I have roasted flesh, and eaten it, and shall I make the residue thereof an abomination? *Shall I fall down to the stock of a tree?* He feedeth on ashes; a deceived heart hath turned him aside, that he cannot deliver his soul, nor say, Is there not a lie in my right hand?"

These and many other passages of Scripture are sufficient to show how intimately the history of the Oak is connected with that of the Hebrews.

The origin of the Greeks is a subject which is involved in much obscurity and fable, as well as that of their oracles. The oracle of Jupiter in the temple of Dodona, near which was a sacred grove of Oaks or Beeches, which the dryades, fauni and satyri, were thought to inhabit, and were frequently seen dancing under the shade of trees. These trees were endued with a human voice and prophetic spirit, on account of which they were called speaking and prophesying Oaks. It is the opinion of others that the oracles were pronounced from the hollow stocks of these trees, because the prophetess or priests could best be concealed there. And it is said that Argo, the ship of the Argonauts, being built with the trees of this wood, was endued with the same power of speaking. Pliny says, the Oaks in the woods of Hercynia, a part of which is now known by the name of the Black Forest in Germany, were believed to be coeval with the world. So extensive was this wood, that Cæsar states that its breadth was a nine days' journey, and its length exceeded sixty. Moses, as we read in Exodus xl. &c., was commanded by the Lord thus: "And thou shalt take the anointing oil, and anoint the tabernacle, and all that is therein, and shalt hallow it, and all the vessels thereof, and it shall be holy: and thou shalt anoint the altar of the burnt-offering, and all his vessels, and sanctify the altar; and it shall be an altar most holy," &c. Jacob, it will also be remembered, "took the stone that he had put up for his pillows, and set it up for a pillar, and poured oil upon the top of it," Gen. xxviii. 18. In like manner the Greeks consecrated the altars to their gods, as well as statues and trees. The solitude and cool shade of groves appears from the earliest records to have been used as sacred places of worship, not only in Europe, but in all parts of the Eastern countries, and lest the Jews should in this manner imitate the Pagans, this precept is given to them: "Thou shalt not plant thee a grove of any trees near unto the altar of the Lord thy God, which thou shalt make thee; neither shalt thou set up any image which the Lord thy God hateth," Deut. xvi. 21.

The pleasantness, the solitude, the seeming secrecy, the deep shade, and silence of groves, fosters a feeling of adoration.

"A darksome grove of Oaks was spread out near,"
Whose gloom impressive told "A God dwells here."

Ovid.

It is probable that such feelings were the original cause of the sacredness of groves, &c., and their single trees, from some real or imaginative reason, became monuments to particular individuals of distinction, and were visited as a tomb of any distinguished person in modern days, and at length became consecrated objects of veneration.

In our own country, the 29th of May, or Oak-apple day, is so called in commemoration of King Charles the Second having concealed himself in an Oak tree, and thus escaped from his enemies, after the battle of Worcester. The Oak is infested with a kind of insect, which deposits its ova in the bark or buds of the tender branches; by this an excrescence in the shape and appearance of a small apple is formed. Loyal men on this day wore them as well as the leaves of the Oak gilded in their hats; wreaths and garlands made of the branches and leaves were variously decorated with ribbons, painted eggs, &c, and carried in procession through the villages with great glee and rejoicings, but now almost forgotten. Dr. Stukeley, in his *Itinerarium Curiosum* Lond. 1724, says that "Not far from Boscobel House, just by the horse track passing through the wood, stood the Royal Oak into which the King and his companion, Colonel Carless, climbed by means of the hen-roost ladder, when they judged it no longer safe to stay in the house; the family reaching them victuals with the nut-hook. The tree is now inclosed in," the author continues, "with a brick wall, the inside whereof is covered with laurel;" and he further adds, "Close by its side grows a young thriving plant from one of its acorns;" and then gives a Latin inscription from the marble tablet over the door, commemorating the event of the King's escape.

The fruit of the Oak *acorns* appear formerly to have been more valuable than the trees themselves. The primitive diet of the ancient Greeks appears to have been acorns. Virgil says, *Geor. i.*

"Ye deities! who fields and plains protect,
Who rule the seasons and the year direct,
Bacchus and fost'ring Ceres, pow'rs divine,
Who gave us corn for *mast*, for water wine."

In Strabo's time Rome obtained its supply of hogs from the woods of Gaul, and Pliny tells us that the Romans expressly provided by the laws of the Twelve Tables that the owner of a tree might gather up his acorns, though they should have fallen on another man's ground; and he further tells us that acorns in his time formed the chief wealth of many nations, and that in times of scarcity *mast* was sometimes ground into meal and mixed with water, and made into bread. Oak woods are still looked upon as of great value for the feeding of swine,

and their flesh thus fed is esteemed sweeter and finer flavoured than any other.

But to trace out the natural or traditional history of the Oak, would be to make this King of the Forest the chronicler of the human race from the Hebrews, the Greeks, the Romans, the Gauls, the Goths, and ultimately interwoven with our history of the Druidical priesthood of old : and in our day the pride of the nation is the enormous power of her navy, or, as it is often called, the "Wooden Walls of Old England," and the vast extent of her shipping, but the limits of this work forbid even the mention of much that is of interest.

The British Naval Oak is unrivalled in the strength and durability of its timber, and the enormous quantity of it that is required for the navy may be calculated, from each seventy-four gun ship consuming in building two thousand tons of wood, the produce of about two thousand well grown trees. When to it is considered the vast quantity of Oak wood that is required for building commercial vessels of all burdens, and also the multifarious uses to which it is applied in the constructions of docks, wharfs, canals, flood gates, and endless domestic purposes, it would seem almost impossible that our little Island should yield a sufficient supply, especially as it is estimated that an acre of ground can only grow about forty trees to perfection as timber fit for shipping.

The *bark* of the Oak is not less esteemed than the wood, from the great quantity of stringent matter which it contains, and is the most valued of all the barks for the tanning of leather. From its astringency it is employed medicinally as an external application, and sometimes combined with aromatics as a tonic in sanguinous discharges; but this peculiarity of the bark is far surpassed in the adventitious productions known by the name of *galls*: of these there are various kinds, found on different parts of the tree and leaves. The only one of the galls of great importance to mention is the nut-gall, brought chiefly from Aleppo. The *Q. infectoria*, upon which it grows, is a small shrubby species of Oak, common in all parts of Asia Minor. These galls are, as before mentioned, produced by the irritation of the ova of hymenopterous insects, deposited in its different parts, as the roots, bark, buds, leaves, &c. : from the large proportion of tanning which they contain, they have been long used for the purpose of dying black, and in the manufactory of black ink, &c. *Quercitron*, a yellow dye, is produced from the bark of *Q. tinctoria*, and the well-known substance *cork* is the cuticle of *Q. Suber*.

The enormous size to which Oaks grow, and the vast period of their existence, is extraordinary. Tortsworth Oak measures round fifty two feet, and the famous Cowthorpe Oak, at its base, seventy-eight, and is believed to be between sixteen and eighteen hundred years old, and in the hollow of its trunk the villagers say seventy persons at a time have been assembled. The Oak at Kidlington has been used as

a prison, and that at Salcey has been enclosed with gates, and used as a pinfold for cattle. Chêne Chapelle, or the Oak of Allonville, in Normandy, holds in its living cavern a Chapel and upper chamber for the dwelling of the officiating Priest. Through the Green-dale Oak, in Welbeck Park, is a road through which we have often rode on horseback, and carriages of the noble owner have been driven, and over this road the living arch still flourishes. Cowper, addressing the Yardley Oak, says—

——“ Oh! couldst thou speak
As in Dodona once thy kindred trees
Oracular, I would not curious ask
The future, best unknown; but at thy mouth
Inquisitive, the less ambiguous past!
By thee I might correct, erroneous oft,
The clock of history; facts and events
Timing more punctual, unrecorded facts
Recovering, and misstated, setting right.”

The highest reward the Romans could give was the *Corona civica*, made of *Oak leaves*. This was awarded to the individual who had saved a citizen from death, and was presented by the appointment of the General by the person saved to the preserver; but under the Emperors we are told by Tacitus it was bestowed by the Prince himself. The persons wearing this crown were honoured by being allowed to sit next the Senate at the public spectacles, and on entering, the audience rose as a mark of respect. For much curious and interesting matter regarding these trees see Burnett's *Amonitates Quernæ*, and much valuable information respecting their mode of propagation, cultivation, &c., will be found in Loudon's *Arboretum et Fruticetum Britannicum*.

GENUS XXI. CASTA'NEA.—TOURN. *Chesnut*.

Nat. Ord. CUPULIFERÆ. RICHD.

GEN. CHAR. *Barren flowers* in very long irregular clustered *cathkins*. *Perianth* single, six-cleft. *Stamens* five to twenty. *Fertile flowers* three, within a thick four lobed *involucre*, very spiny on the outside. *Perianth* single, urceolate, five or six lobed, and with the rudiment of twelve stamens, smooth on the outside, lined with a stout shining coat of hairs within. *Ovarium* six celled, incorporated with the perianth six *celled*, each cell two seeded, five of which are mostly abortive. *Styles* six. *Fruit* a sub-rotundate one to three seeded *nut*, enveloped in the enlarged spiny *involucre*.—Name from *Castanea*, in Thessaly, which produced magnificent Chesnut trees.

1. *C. vulga'ris*, Lam. (Fig. 1462.) *Spanish Chesnut*. Leaves oblong lanceolate, acuminate, with mucronated serratures, smooth on both sides.

Hooker, British Flora, ed. 4. vol. i. p. 348.—Lindley, Synopsis, p. 239.—*Fagus castanea*, Linn.—English Botany, t. 886.—English Flora, vol. iv. p. 151.

A stately tree, rivalling in beauty and duration the British Oak. The trunk and larger branches are clothed with thick deeply cleft bark, the *branches* widely spreading, with the smaller ramifications clothed with smooth polished bark. *Leaves* numerous, five to eight inches long, elliptic lanceolate, with an acuminate point, smooth, bright green above, paler beneath, with a prominent mid-rib and lateral veins, terminating in mucronated serratures. *Barren flowers* in long slender *catkins*, with numerous clusters of flowers, irregularly arranged, the *perianth* inconspicuous, with numerous yellow *stamens*, having slender *filaments* and two celled *anthers*. *Fertile flowers* one or several, more or less clustered, on a short stalk. *Perianth* urn-shaped, becoming large, globose, and very spiny. *Styles* about six, with long smooth erect *stigmas*, often a purplish colour. *Nut* large, sub-rotundate or ovate, its skin smooth, polished, dark brown, with a broad scar at the base, by which it was attached.

Habitat.—Woods in the Southern parts of England; apparently wild.

Tree; flowering in May.

The Chesnut is one of the most noble and majestic trees of the forest, and rivals, if it does not surpass, in durability the British Oak. It is highly ornamental as a forest tree and for plantations in parks. The great Chesnut at Tortworth, Gloucestershire, (formerly Tamworth), has been a boundary mark of the Manor of Tamworth probably for more than a thousand years; it was referred to in the time of King Stephen, A.D. 1135, as "the great Chestnut of Tamworth," so that it is supposed to have been growing at the time of Egbert, the Saxon, A.D., 827, the "Beginning of the Kingdom of England." This venerable monument of antiquity measures about fifty-two feet in circumference; is still flourishing in its "green old age," and will probably still rear up its venerable head gay in its vernal dress, while the frail bodies of the proud, the rich, and the poor of this generation will be mouldering into dust. But the largest Chesnut tree of which we have any account is the celebrated Castagno di Cento Cavalli, the ruins of which are still in existence on Mount Etna, in Sicily. This tree is said to have measured in its circumference one hundred and sixty feet, and that within the hollow of its trunk the peasants have erected a house wherein they have an oven to dry Chesnuts and other fruit. It obtained the name of Castagno di Cento Cavalli, from the circumstance of its having given shelter to

Jean of Arragon, and her attendant nobility, amounting to a hundred persons, from a storm on Mount Etna.

The wood of the Chesnut is much esteemed for millwright work, water works, house building, &c., &c., and in Italy a great part of the furniture is made of this material, and when polished is as beautiful as walnut wood, and quite as durable.

Chesnuts with us are used only as an article of luxury, being brought to table roasted after dinner; they also enter into some of the compositions of cookery as stuffing for turkeys, &c. But on the Continent, and especially in the mountainous districts of Italy, where vast tracts are covered with this tree, and where there is but a very scanty supply of corn, and this grown in terraces on the mountain sides with the vine and olive, the peasants are obliged to depend upon the produce of the Chesnut for their winter's food; and when it fails to yield the usual crop, the sufferings of the people are very great, for in many districts these nuts are their entire support. About the end of September the nuts are ripe, and fall from their spiny case; before this period the owners of the woods cut down all the weeds, and clear the ground for gathering. The nuts are dried in ovens after they have been deprived of their skin, and ground into flour, which is then mixed with water, and rolled into thin cakes, and with layers of the leaves of the tree top and bottom it is baked between stones. These cakes are similar to our oat cakes in appearance, but have a sweet taste. This, which is called *Pane di Castanea*, or *Pane dolce*, is preferred by children accustomed to its use to wheaten bread. Besides this mode of preparing Chesnuts, they both roast and boil them, and in this state they are sold at the corner of the streets in every town in Italy, and from the quantities seen constantly cooking they must be in great demand. It is not in Italy only that they are thus used as an article of food, but in Spain, Portugal, and the South of France; and it is probable that the *mast* spoken of by the ancient authors, on which our forefathers fed before corn was introduced as food, was frequently Chesnuts, as well as acorns and beech nuts. The leaves of the Chesnut tree in Italy are collected and used as bedding for cattle.

GENUS XXII. FAGUS.—LINN. *Beech*.

Nat. Ord. CUPULIFERÆ. RICH.

GEN. CHAR. *Barren flowers* in globose catkins, pendulous. *Perianth* single, bell-shaped, six-cleft. *Stamens* five to twelve. *Fertile flowers* two, in a four lobed prickly involucre. *Perianth* single, urceolate, four or five lobed, adhering to the ovary. *Styles* three. *Ovary* three angled, three celled. *Fruit* a three

angled *nut*, three celled, two of which are abortive, one or two seeded, invested with the enlarged involucre.—Name *Φαγος*, in Greek; from *Φαγω*, to eat; in allusion to the fruit having been eaten as food.

1. *F. sylvatica*, Linn. (Fig. 1465.) *Common Beech*. Leaves ovate, smooth, obsolete toothed, their margins ciliated.

English Botany, t. 1846.—English Flora, vol. iv. p. 152.—Hooker, British Flora, ed. 4. vol. i. p. 348.—Lindley, Synopsis, p. 239.

A handsome spreading *tree*, with smooth bark. *Leaves* ovate, about two inches long, smooth, dark, shining, green above, paler beneath, the margins somewhat toothed or waved, and when young copiously ciliated with fine hairs and downy veins, petioles rather short, channeled, downy. *Barren flowers* on long slender silky pendulous peduncles, collected into a terminal globose head. *Stamens* about eight, from the base of a six-cleft bell-shaped perianth, the *filaments* slender, and *anthers* oblong, yellow, two celled. *Fertile catkins* on stout erect downy stalks. *Involucre* downy and prickly, investing the four or five lobed perianth. *Stigmas* three, spreading, downy. *Nuts* two or three, acutely triangular.

Habitat.—Woods, especially in the South of England; scarcely wild in Scotland.

Tree; flowering in April and May.

The Beech is one of our most handsome trees to stand alone in lawns or in parks, especially the purple leaved variety. When properly trained and cut, it forms one of the best high hedges, and has the advantage when thus cultivated of keeping on its leaves all winter. The bark is remarkably thin, but tough, and taken off in large sheets it is used for making baskets, band boxes, &c. The wood is close grained, but brittle, and not of long duration; it is chiefly used by joiners, and for some kinds of millwright's work. It is also much used by turners for making wooden vessels, bowls, tool handles, &c.; and Virgil, in his Third Pastoral, makes Menelas to bet with Darnætas, what he appears to value, and says—

“ Two bowls I have well turn'd of *beechen wood*;
Both by divine Alcimedon were made;
To neither of them yet the lip is laid.
The lids are ivy; grapes in clusters lurk
Beneath the carving of the curious work,
Two figures on the sides emboss'd appear—
Conon, and what's his name, who made the sphere,
And shew'd the seasons of the sliding year,
Instructed in his trade the lab'ring swain,
And when to reap, and when to sow the grain.”

The nuts abound in a thick kind of oil, which is said to be expressed and used as butter by the poor people of Silesia. It is one of

the trees yielding the nuts called *mast*, which were used as food by the ancients; swine are very fond of them, and Beech nuts are much valued for fattening them in the autumn: they are also a favourite food of deer.

GENUS XXIII. CORYLUS.—LINN. *Hasel-nut*.

Nat. Ord. CUPULIFERÆ. RICH.

GEN. CHAR. *Barren flowers* in a cylindrical *catkin*, its scales three lobed, the middle one [largest, and covering the lateral ones. *Stamens* eight. *Anthers* one celled. *Fertile flowers* several, (*perianth* obsolete), enclosed in a scaly bud. *Stigmas* two. *Fruit* a one seeded *nut*, invested at the base with the united coriaceous scales of the involucre.—Named from *κorymbos*, a *casque*, or *cap*; so called from the fruit invested with its involucre, appearing as if covered with a cap or bonnet.

1. *C. Avellana*, Linn. (Fig. 1466.) *Common Hasel-nut*. Stipules oblong, obtuse; leaves roundish, heart-shaped, pointed; involucre of the fruit campanulate, rather spreading, torn and toothed at the margin.

English Botany, t. 723.—English Flora, vol. iv. p. 157.—Hooker, British Flora, ed. 4. vol. i. p. 350.—Lindley, Synopsis, p. 240.

A small branched *tree* or *shrub*, with smooth bark, the branches clothed with fine pubescence, and often glandular. *Leaves* alternate, roundish, with a heart-shaped base, two or three inches across, acuminate at the point, lobed, and doubly serrated on the margin, dark green above, pale beneath, and more or less downy. *Barren catkins* axillary and terminal, one or two together or clustered, formed in the autumn, but enlarging and opening in the spring, about two inches long, cylindrical, the scales downy. *Fertile flowers* several, invested with brown scales in the form of a bud. *Stigmas* prominent, purple, downy, awl-shaped. *Nuts* sessile, roundish ovate, half covered by the investing perianth in the form of a cup, with the margin torn and toothed.

Habitat.—Hedges and copses; abundant.

Tree; flowering in March and April.

The Hasel-nut tree is a well-known underwood plant in almost all parts of the country, and though it does not grow to any great size, its branches are applied to many useful purposes, as hoops of casks, fishing rods, walking sticks, crates for packing earthenware, &c., hurdles, springles for fastening down thatch, &c. The nuts, which are some years much more abundant than others, are well known as a dessert fruit, and sold in great quantities in our markets. The specific name *Avellana* is derived from Avellino, a town in the king



1465 *Fagus sylvatica.*



1466 *Corylus Avellana.*



Carpinus Betulus.

1467



1468 *Betula alba,*



1469 *Betula nana.*



1470 *Myrophyllum spicata.*

dom of Naples, near which in a valley they grew in great abundance, and were extensively exported, yielding, 'it is said, at one time an annual profit of about £12,000 sterling. And the word *Hasel-nut* is derived from the Anglo-Saxon *Hasel-nuter*; *Hasel*, a *cup*, in allusion to the shape of the involucre; and *Knutu*, a nut.

There are few persons who have enjoyed the privilege in their youth of having lived in the rural districts of our country, but have looked forward with delight to the enjoyments of each period of the year as it rolls on in its changes, who do not look back with delight to those days when in their maturer years the cares and realities of life encompass them; and perhaps there is no period of our youth to which the mind recurs with greater pleasure than the "nutting season," when we saw the rich brown clusters hang drooping in their matured garb, and all surrounding nature seemed luxuriating in the full accomplishment of its summer's influence.

" ————— It seems a day,
(I speak of one from many singled out),
One of those heavenly days which cannot die,
When, in the eagerness of boyish hope,
I left our cottage-threshold, sallying forth
With a huge wallet o'er my shoulders hung,
A nutting crook in hand, and turned my steps
Towards the distant woods, a Figure quaint
Tricked out in proud disguise in cast off weeds,
Which for that service had been husbanded,
By exhortation of my frugal dame.

* * * * *

————— And unless I now
Confound the present feelings with the past,
Even then when from the bower I turned away
Exulting, rich beyond the wealth of Kings,
I felt a sense of pain when I beheld
The silent trees and the intruding sky."

GENUS XXIV. CARPINUS.—LINN. *Hornbeam*.

Nat. Ord. CUPULIFERÆ. RICH.

GEN. CHAR. *Barren flowers* in long cylindrical *catkins*, its scales roundish, ciliated at the base. *Stamens* eight to twenty. *Fertile flowers* in lax *catkins*, its scales large, leafy, three lobed, single flowered. *Perianth* scale-shaped, three lobed, two flowered, adhering to the ovary. *Ovary* two celled, one abortive. *Styles* two. *Fruit* an ovate striated one seeded *nut*.—Name from the Celtic *car*, *wood*; and *pin*, a *head*; so called from the wood having been used to make the yokes of oxen.

1. *C. Betulus*, Linn. (Fig. 1467.) *Hornbeam*. Scales of the fruit leafy, three lobed, the middle lobe oblong, serrated, or entire.

English Botany, t. 2032.—English Flora, vol. iv. p. 155.—Hooker, British Flora, ed. 4. vol. i. p. 849.—Lindley, Synopsis p. 240.

A low rigid tree, with smooth pale bark. *Leaves* ovate, acute, petiolated, about two inches long, doubly serrated on the margin, smooth, dark green above, pale beneath, with a prominent mid-rib and lateral veins, downy, especially when young. *Stipules* oblong, obtuse, smooth, soon falling away. *Barren catkins* long, pendulous, cylindrical, its scales roundish, acutely pointed, somewhat downy and ciliated on the margin. *Fertile catkins* lax, terminal, with ovate lanceolate scales, becoming when in fruit much enlarged, and of a leafy texture, three lobed, the lateral lobes short, the middle one oblong, much larger, entire or serrated on the margin, the mid-rib prominent, and the lateral ones slender, netted. *Fruit* at the base of the scales, an ovate angular nut, about the size of a grain of barley, green, single seeded.

Habitat.—Woods and hedges in a poor tenacious soil.

Tree; flowering in May.

The Hornbeam, when standing alone, and in a situation and soil suited to it is by no means an unhandsome tree. The wood is white, tough, and hard, and is called Hornbeam wood, from its having been used for making the yokes for oxen. It is used by turners, for making various implements of husbandry, cogs of wheels, &c; it is of a close hard texture, white, and burns well.

GENUS XXV. BETULA.—LINN. *Birch*.

Nat. Ord. BETULINÆ. RICH.

GEN. CHAR. *Barren flowers* in cylindrical catkins, its scales three flowered, the middle one bearing stamens. *Fertile flowers* in cylindrical catkins, its scales three lobed, three flowered, membranous. *Styles* two. *Ovary* compressed, two celled, one of the cells abortive. *Fruit* a compressed one celled nut, with winged margins.—Name from *betu*, the Celtic name of the Birch.

1. *B. alba*, Cinn. (Fig. 1468.) *Common Birch*. Leaves triangular, ovate acuminate, doubly serrated, smooth.

English Botany, t. 2198.—English Flora, vol. iv. p. 135.—Hooker, British Flora, ed. 4. vol. i. p. 347.—Lindley, Synopsis, p. 228.

β. pendula. Branches long, slender, drooping, warty.

B. pendula, Roth. Lindley, Synopsis, p. 229.

γ. pubescens. Leaves somewhat heart-shaped, and often downy beneath.

B. pubescens, Ehrh.—*B. glutinosus*, Fries.—Babington, British Botany, p. 282.

A tree of graceful appearance, with white smooth shining bark when young, but deeply cleft as it becomes older. *Branches* long, slender, the ultimate divisions very slender, and more or less drooping, quite smooth, or more or less warty. *Leaves* ovate, triangular, with an acuminate point, the margins unequally and doubly serrated, smooth, rather dark green above, paler beneath, with prominent mid-rib and veins, and smooth, or somewhat downy, petiolate. *Flowers* in cylindrical *catkins*, on slender stalks, terminating the buds and branches, *fertile* ones short, thick, with three lobed membranous scales, three flowered, *barren* catkins long, pendulous, with ternate scales, the middle scale largest, ovate, acute, often ciliated on the margin, and bearing at the base about twelve *stamens*, with short *filaments*, and roundish two celled yellow *anthers*. *Fruit* an oblong compressed *nut*, with a broad thin membranous lobe on each side, much larger than the nut.

Habitat.—Woods, especially in a mountainous district.

Tree; flowering in April and May.

There are several varieties of the Birch, which appear to be caused by the situation in which they have grown. The more remarkable ones are the *β. pendula*, or Weeping Birch, which is known by its having its shoots and branches more slender, smoother, and pendulous, while the main stem and branches are higher than is usual. The variety *γ. pubescens* is distinguished by its leaves being more heart-shaped than rhomboidal, often downy beneath, and the fruit is somewhat broader. It does not usually attain so great a height; nor is it so graceful a tree as the pendulous variety.

The common Birch is a native of cold regions, requiring, according to Von Buch, the mean temperature of 26° Fahrenheit; its boundary line of growth being, according to the same author, 1,937 feet below the line of perpetual snow, and 802 feet above that of the Scotch Pine. According to M. A. De Candolle, it is never found in Switzerland above the height of 4,400 feet. It is found in all parts of the old Continent in its cooler regions; the higher parts of Asia and Siberia; and in most parts of North America. It is one of the most frequent trees in Russia, forming immense woods in some parts, and used as an ornamental tree in pleasure grounds in others. The Birch is one of our most beautiful and graceful forest trees; its long slender branches waving with every passing breeze give it an elegant appearance; it is with true poetic feeling called by Coleridge "The Lady of the Woods;" and Professor Wilson, in his Isle of Palms, thus speaks of the Birch—

———— "On the green slope

Of a romantic glen we sat us down,

Amid the fragrance of the yellow broom;

While o'er our heads the weeping birch tree stream'd,

Its branches arching like a fountain shower."

It flourishes as well in poor as rich soil ; on barren moors, and in sub-alpine districts. When naked lands are wanted speedily to be wooded, the Birch is one of the best, from the circumstance of its producing abundance of seeds, which disperse themselves all around, and speedily form a covering. Birches have too the advantage of not being injurious to the growth of other trees, such as the Oak or Pine, which may be growing or planted with them. The tree is about the middle size, being usually about fifty feet high, but in favourable situations it attains the height of eighty feet. The wood is white, somewhat shaded with red, and durable when protected from wet ; it is employed by wheelwrights and furniture makers for a variety of purposes, as well as by coopers and turners. In the northern parts of Europe, especially Lapland, it is applied by the natives to the purposes of building huts, making furniture, fuel, shoes, &c. The twigs are made into baskets, and form their beds, both for winter and summer. The well-known instrument of castigation, the "birch rod;" and "birch brooms" are valued for their usefulness throughout Europe, though applied to such different uses. The bark is thin, but tough and very durable, and abounds with oil and pyroligneous acid, which are obtained by burning the bark in kilns, surrounded with turf, when the oil flows through an opening at the bottom of the kiln into vessels placed to receive it. It is this product which gives the powerful smell to Russian leather ; if the liquor be distilled, a clear oil passes over, having all the essential properties of the liquor, and a kind of tar remains, which is used for greasing cart wheels, &c., Russia leather, from its odour, is much esteemed for binding books, as it is said no insects will then attack them. The bark is stripped from the trees in large sheets by the Laplander, and applied to many useful purposes, on account of its durability and power of resisting decomposition from the oil which it contains. Trees may frequently be seen in old woods that have been blown down with the wood decayed away while the bark remains perfect ; for this reason they use it for roofing their huts, &c., as we use slates. They form it into capes, leggings for boots and shoes, &c. It is also made into baskets, boxes, mats, &c., and they twist it into cordage for harnessing horses and the rein-deer. They use it also for lighting fires, and burn it as candles ; it tans their leather, and dyes their woollen goods a brownish yellow : besides these and many other purposes to which the tree and its bark are applied, the bole is tapped in the spring, and from it they obtain a great quantity of sap, which is transparent and colourless, without smell ; and according to Dr. John, 1,730 grains contains four grains of sugar, besides which also there is present a little ammonia ; but both the ammonia and sugar are in greater or less proportion, according to the developement of the tree : it is fermented with yeast into *beer*, having been previously boiled with hops, and it is evaporated for the sugar which it contains. Birch *wine* is made by boiling with every gallon of fresh sap four

pounds of sugar; it is then fermented with yeast in the usual way. To every gallon of the clear liquor some people add the juice and rind of a lemon, and the rind of a Seville orange, and occasionally also is put into the cask after it is tunned a little cinnamon or other aromatic. It requires being kept three months in the cask before it is bottled, and twelve months or more before it is drunk. It is a wholesome wine, with an agreeable flavour, and if carefully made is effervescent like champagne.

The Birch tree gives food to more insects perhaps than any other of our native trees, and upon its bark several curious Fungi grow, as well as Lichens.

" Sweet bird of the meadow, soft be thy rest,
Thy mother will wake thee at morn from thy nest,
She has made a soft nest little redbreast for thee,
Of the leaves of the birch, and the moss of the tree."

Leyden.

In America the "Canoe Birch" (*B. papyracea*) is so called from the bark being used for making canoes; these vessels are so light that one large enough to hold four persons does not weigh more than fifty pounds. It was the inner bark of this as well as other species on which the ancients wrote, before the invention of paper making and printing.

2. *B. na'na*, Linn. (Fig. 1469.) *Dwarf Birch*. Leaves sub-orbicular, crenate.

English Botany, t. 2326.—English Flora, vol. iv. p. 154.—Hooker, British Flora, ed. 4. vol. i. p. 349.—Lindley, Synopsis, p. 229.

A bushy *shrub*, two or three feet high, much branched, downy when young. *Leaves* numerous, small, petiolated, nearly orbicular, smooth, beautifully netted with pale veins, especially beneath, the margin crenated, with roundish obtuse teeth. *Stipules* two, brown, lanceolate, membranous. *Barren flowers* in erect cylindrical short catkins. *Fertile catkins* ovate, brown, erect, terminal, its scales three lobed, three flowered. *Stigmas* two, awl-shaped, pink. *Fruit* roundish, obovate, with two membranous wings.

Habitat.—Highlands of Scotland; rare in the Lowlands.

Shrub; flowering in May.

This humble shrub is almost the only one the poor Laplanders meet with in some parts of their country, and it constitutes their fuel for cooking, and serves various other purposes, besides that of making their beds, along with a rein-deer's skin for a covering. It is frequently mentioned by Linnæus in his Lapland tour.

GENUS XXVI. MYROPHYLLUM.—LINN. *Water Milfoil.*

Nat. Ord. HALORAGACEÆ. BROWN.

GEN. CHAR. *Barren flowers* calyx inferior, four partite. *Petals* four, alternating with the lobes of the calyx. *Stamens* eight. *Fertile flowers* calyx four lobed. *Petals* four, or wanting. *Stigmas* four, sessile. *Fruit* four nuts, compressed, sub-globose, single seeded.—Name from μυριάς, a *myriad*; and φύλλον, a *leaf*; in allusion to the much divided leaves.

1. *M. spica'tum*, Linn. (Fig. 1470.) *Spiked Water Milfoil.* Spike terminal, naked, interrupted, erect when in bud, barren flowers whorled, spiked; fertile flowers whorled; leaves whorled, pectinated, with setaceous segments.

English Botany, t. 83.—English Flora, vol. iv. p. 143.—Hooker, British Flora, ed. 4 vol. i. p. 347.—Lindley, Synopsis, p. 110.

Root long, fibrous, the whole plant [except the spike under water. *Stem* round, slender, smooth, more or less branched, dark green, as well as the leaves. *Leaves* numerous, in crowded whorls, pectinated with long bristle-like segments, opposite and alternate. *Inflorescence* a terminal interrupted *spike*, one to five inches long, of more or less numerous flowers in whorls, the lower ones with pectinated *bractea*, and the upper with entire ones. *Fruit* sessile, four *nuts*, in a whorl, sub-globose, compressed, single seeded.

Habitat.—Ditches and pools; frequent.

Perennial; flowering in July and August.

2. *M. alterniflorum*, De Cand. (Fig. 1472.) *Alternate flowered Water Milfoil.* Spike terminal, naked, interrupted, nodding when in bud, erect when in flower; barren flowers alternate, spiked; fertile flowers in whorls at the base of the spike; leaves whorled, pectinated, with capillary segments.

English Botany, Suppl. t. 2854.—Babington, British Botany, p. 108.

Roots whorled, fibrous, the whole plant except the spike submerged. *Stem* round, slender, smooth, branched, the branches alternate and opposite. *Leaves* three or four in a whorl, olive green, pectinated, the segments fine, hair-like. *Inflorescence* a terminal interrupted spike, nodding when in bud, erect when in bloom, *barren flowers* alternate, mostly four flowered, sometimes six, in the axis of oblong bracts, which become enlarged after flowering, and are seldom more than three, united at the base, *fertile flowers* in whorls at the base of the spike. *Fruit* sessile, ovate, *nuts* rough, sub-compressed.

Habitat.—Ponds and ditches; about Lincoln frequent, and Sutton-on-Trent, Nottinghamshire.

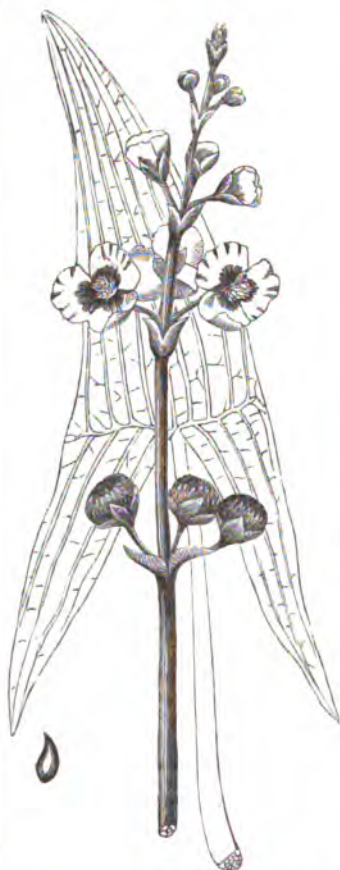
Perennial; flowering in July and August.

This species, readily distinguished from the above, is perhaps more frequent than is supposed, from their frequently growing together,

1471 *Myrophyllyum verticillatum.*



1472 *Myrophyllyum alterniflorum.*



1473

Sagittaria sagittifolia.



1474

Pinus sylvestris.

and being overlooked as a small plant only instead of being so distinct a species. We found it several years since frequent about Lincoln, and Sutton-on-Trent, Nottinghamshire.

8. *M. verticillatum*, Linn. (Fig. 1471.) *Whorled Water Milfoil* Flowers in terminal axillary whorls; leaves whorled, pectinated, with setaceous segments.

English Botany, t. 218.—English Flora, vol. iv. p. 148.—Hooker, British Flora, ed. 4. vol. i. p. 347.—Lindley, Synopsis, p. 110.

Roots whorled, fibrous. *Stem* round, smooth, the lower part under water, with the whorls of leaves cut into fine capillary segments, the upper flowering part above the water, with the leaves having a broader somewhat dilated mid-rib, and the segments broader than those of the lower leaves. *Inflorescence* whorls of about four flowers in the axis of the upper leaves, sessile, inconspicuous, much shorter than the leaves. *Stigmas* four, spreading, thickly feathery. *Fruit* a one seeded, sub-compressed nut.

Habitat.—Ponds and ditches; Norfolk, Cambridge, Cheshire, meadows near Nottingham, near Sheffield, Yorkshire, and Anglesea.

Perennial; flowering in July.

This is a variable plant, from growing in pools, which, as they become partly dried up in the summer, leave the plant exposed, when part or the whole of the leaves become more dilated both in the mid-ribs and segments; indeed, we have some specimens from Nottingham meadows, which have the mid-rib so much dilated that the segments are only narrow teeth, and again other specimens from deep pools, with all the segments of the leaves drawn out into long capillary segments, the spike only appearing above the water, with its leaves more dilated.

GENUS XXVII. SAGITTARIA.—LINN. *Arrow-head*.

[Nat. Ord. ALISMACEÆ. BROWN.]

GEN. CHAR. *Barren flowers* calyx of three pieces. *Petals* three. *Stamens* numerous. *Fertile flowers* calyx of three pieces, petals three, *ovaries* numerous, on a globose receptacle. *Capsules* small, compressed, margined, single seeded.—Name from *sagitta*, an arrow, from the shape of the leaves.

1. *S. sagittifolia*, Linn. (Fig. 1473.) *Common Arrow-head*. Leaves arrow-shaped, with straight lanceolate lobes, the scape simple.

English Botany, t. 84.—English Flora, vol. iv. p. 144.—Hooker, British Flora, ed. 4. vol. i. p. 347.—Lindley, Synopsis, p. 253.

Roots fibrous, from a large globular fleshy tuber, and putting out bulbiferous runners, the whole plant smooth, with somewhat milky

juice. *Leaves* several, on long cellular triangular footstalks, truly arrow-shaped, with two straight lanceolate lobes at the base, the terminal one lanceolate, often obtusely pointed, a fine green above, paler beneath, with pale veins. *Scape* simple, terminating in several distant whorls of three flowers each, from the axis of an ovate membranous bractea, all on stalks of greater or less length, the lower whorls fertile, the upper barren. *Ovary* of three ovate sub-membranous pieces. *Petals* white, roundish obtuse, with a short purple claw, deciduous. *Fruit* numerous, carpels crowded into a globose head. *Carpels* obovate, compressed, tumid, with a short beak and dilated margin, single seeded.

Habitat.—Ditches and margins of rivers; frequent in England and Ireland.

Perennial; flowering in July and August.

This appears to be one of the most widely distributed plants. It is found in all parts of Europe, East India, China, and North America. It is one of our most beautiful aquatic plants, and flourishes well under cultivation. The tubers abound in starchy matter, and it is said that they are used in China and Japan as an article of food. The leaves vary considerably in size, and in the lobes being more or less narrow.

ORDER VIII.

MONODEL'PHIA. (*Stamens united into one set*).

GENUS XXVIII. PINUS.—LINN. *Fir*.

Nat. Ord. CONIFERÆ. JUSS.

GEN. CHAR. *Barren flowers* crowded into terminal racemose *catkins*, the scales peltate, bearing two single celled *anthers*. *Fertile flowers* in compact ovate *catkins*, or *cones*, its *scales* acuminate, closely imbricated, two flowered. *Ovaries* two. *Stigmas* glandular. *Nuts* in pairs, single seeded, terminated by a long winged membranous appendage.—Name "*pin*, or *pen*," means a *crag*, or stony mountain, still so called in Wales, (as *Ben* in Scotland,) where the *pine* delights to grow, "moored in the rifted rock."

1. *P. sylvestris*, Linn. (Fig. 1474.) *Scotch Fir*. Leaves linear, rigid, in pairs; cone conico-ovate, pedunculated, recurved when in fruit; anthers with a very small crest; wings three times longer than the nut.

English Botany, t. 2460.—English Flora, vol. iv. p. 158.—Hooker, British Flora, ed. 4. vol. i. p. 845.—Lindley, Synopsis, p. 241.

A tall straight *tree*, clothed with thick rough scaly bark. *Leaves* narrow, linear, striated, concave above, convex beneath, a dull glaucous green, about two inches long, growing in pairs, enveloped at the base in a membranous sheath, crowded at the end of the branches, arranged in a spiral manner, and leaving a rough scar in the bark. *Barren catkins* terminal, naked, of numerous crowded stamens, with short *filaments*, and erect yellow *anthers*, of two cells, bursting lengthwise, and crowned with a short membranous crest, from the end of the catkin a tuft of leaves soon appear, and the stamens fall away. *Fertile catkins* mostly in pairs, pedunculated, and erect when young, recurved and pendulous when in fruit, of an ovate conical shape, about two inches long, tuberculated in a tessellated manner with its imbricated scales, hard, woody, at length separating for the escape of the seeds.

Habitat.—Highlands of Scotland, in vast natural forests.

Tree; flowering in May and June.

The *Pinus sylvestris*, or Scotch Fir, is so called from its being our only indigenous species of the genus; it forms immense woods in the Highlands of Scotland.

“Where o’er the rock the scarcely waving pine,
Fills the broad shade with a religious awe.”

It is a native also of the Alps, and northern parts of Germany, as well as Sweden and Norway. It is a tall stately looking tree, with a port of much grandeur and beauty, having a straight trunk, often of very large dimensions. Sir W. J. Hooker mentions a tree cut down in the Duke of Gordon’s forests, which was sawn into planks, measuring five and half feet in diameter. They live to the age not unfrequently of four or five hundred years. It will grow in almost any kind of soil; but the wood of those grown in the Lowlands is said to be inferior to that grown upon the mountains of the Highlands. There are two varieties which are common, one producing the white and the other the red deal of commerce—woods applied to many useful purposes, too well known to require to be enumerated. *Resin* is obtained from this tree by taking out a portion of bark in the month of May near the base of the trees most vigorous and exposed to the sun. The resinous juice soon begins to flow, and is received into vessels. In this manner from six to twelve pounds of the juice may be obtained annually for centuries from the same tree. These juices are afterwards purified by being put into casks, perforated at the bottom, and exposed to the sun; when the melted resin runs through, it is purified of all extraneous matters, as bits of bark, wood, leaves, &c., and is fit for sale. From this, *Oil of Turpentine* is obtained, by distilling it with water in a common still. The oil floats on the water in the receiver, from which it is easily separated, and kept in bottles for use; that which remains

in the still is the *common resin* of commerce ; and if the residue is, while cooling, agitated with water, it loses some of its grosser impurities, becomes of a paler yellow colour, and is called *yellow resin*.

The roots furnish the *Tar* of commerce, which is obtained by burning them with a smothered flame in cone-shaped heaps, surrounded with sods. The tar runs from the bottom of the pit during the combustion, and is conveyed along channels into vessels placed to receive it.

The bark of the Fir is used by the Norwegians in times of scarcity to make bread ; for this purpose the bark is stripped from the older trees, and the alburnum, which is white, succulent, and fibrous, is separated, and kept for use. The natives prepare it for this purpose, by baking it until it is hard ; it then becomes porous : this ground into powder, and kneaded with water, is formed into cakes. This miserable substitute for bread is of a brown colour, and flavoured with the resin of the tree, the nutriment which it contains is very little, and depends upon the starchy matter present in the bark. The outer bark is soft, light, and spongy, and is used in the place of cork, and the young shoots are collected and used as food in the form of salad, and when dried it is kept in store as winter provender for the rein-deer.

The uses to which tar is applied, especially in ship building, are well known, and the protection it affords, when painted over exposed wood work, is in its forming a varnish, which excludes the action of the air and moisture. It is well known that Fir piles will last longer under water than any other wood, a circumstance owing, no doubt, to the cells of the wood being studded over with glands, which secrete the resinous juices ; but if the wood is exposed to the action of sun and water alternately, the juices are soon evaporated, and the wood speedily perishes.

All the Pines and Fir tribe abound with resins in combination with essential oils more or less fragrant ; from the *P. Teda* the frankincense is obtained. In the early history of the Greeks we find that the sacrifices which they offered to their gods were those things which they most prized for themselves as food, such as acorns, fruits, and green herbs ; but in more modern times they used frankincense, though at the era of the Trojan war, according to Pliny, they offered instead of that cedar and citron. The offering up of similar oblations to the gods was customary in most other nations. Ovid, in describing the sacrifice of the primitive Italians, says—

“ In former times the gods were cheaply pleas'd,
A little corn and salt their wrath appeas'd,
Ere stranger ships had brought from distant shores,
Of spicy trees the aromatic stores ;
From India or Euphrates had not come
The fragrant incense or the costly gum ;

The simple savin on the altars smok'd,
A laurel sprig the easy gods invok'd,
And rich was he, whose votive wreath possess'd
The lovely violet with sweet wild flowers dress'd."

It would be an interesting investigation to trace through the history of mankind, especially of the early races of men observing that in them there was always a feeling of dependance upon a superior being, and that they thought themselves to be deserving of punishments from their superiors, and they offered to them their oblations to purchase forgiveness from their evils, and these gifts at first we find are the simple fruits of the earth; but as men increased in wealth, so did the gifts which they presented even to the gods of their own creation. It would be out of place here to enter upon the question as to the founders of Greece being acquainted with the customs of the family and descendants of Abraham, and took with them a knowledge of the true God. We know that Cain and Abel made their offerings unto the Lord; and that Noah, after he had left the ark, "builted an altar unto the Lord, and took of every clean beast, and of every clean fowl, and offered burnt offerings on the altar." So that a traditional knowledge of these things may have been handed down to the descendants of Noah, though they forgot the true God, and sacrificed to idols, and offered to them those gifts and sweet smelling odours. In the Mosaic account full descriptions are given for the preparing the incense of sweet spices, which incense, we are told in the fifth of Revelations, is "the prayers of the saints;" and again in the 8th chapter and 3rd verse it is said, "Another angel came and stood at the altar, having a golden censer; and there was given unto him *much* incense, that he should offer it with the prayers of all saints upon the golden altar, which was before the throne. And the smoke of the incense which came with the prayers of the saints ascended up before God out of the angel's hand. And the angel took the censer, and filled it with the fire of the altar, and cast it into the *earth*; and there were voices, and thunderings, and lightning, and an earthquake." As the Priest of Pagan Rome used the fume of frankincense for the gratification of their dumb gods, we are much reminded of these customs, in seeing incense as used by modern Romans in some of their ceremonies of the Christian worship.

The Fir tree was dedicated to Bacchus, as well as the vine, ivy, &c., hence it is that we frequently see this Pagan god represented with a wand or thyrsus in his hand, having at the top of the stick or cone the fruit of the fir tree, and twisted round the stick a branch of ivy or vine, and in his hand a vessel of wine or bunch of grapes, all emblematic of the trees dedicated to him. It is the custom of the Greeks of the present day to flavour some of their wines by putting into it the cones of the Fir, and this practice they seem to derive from

the ancients. This may be the reason of the thyrsus or staff of Bacchus always being mounted with the Fir cone.

The Fir tree is often spoken of in Scripture as being applied to building purposes; and it is related "that David and all the house of Israel played before the Lord on all manner of instrumentis made of fir wood." It is used as a token of the Lord's pleasure, in Isaiah, ch. lv., v. 12 and 13, "The mountains and the hills shall break forth before you into singing, and all the trees of the field shall clap their hands; instead of the thorn shall come up the fir tree, and instead of the brier shall come up the myrtle tree." And he who has ever been under the shadow of the Fir tree, when the wind is hurrying through its branches, will he not remember the lament of Zechariah ii. v. 2, "Howl, fir tree; for the cedar is fallen, because the mighty are spoiled." These, and many other passages of Scripture, renders the Fir tree an object of great interest to the biblical student.

From the *Pinus Larix* the Venice turpentine is obtained, and from *Pinus Canadensis* Canada Balsam is derived. Burgundy Pitch is the produce of *Pinus abies*, all possessing the same general properties, having a somewhat aromatic odour, a warm pungent taste, semifluid in consistence, tenaceous, translucent, combining readily with fixed oils, very inflammable, burning with a white flame and much smoke. The soot is the lump black of the shops. It is dissolved by alcohol, but water only takes up a little of the essential oil; distilled with water the volatile oil passes over with the water, and towards the end of the operation succinic acid, so that it is a compound of resin, volatile oil, and succinic acid. The balsams are used as internal medicines in diseases of the urinary organs, with variable success. The resins enter into the composition of stimulating ointments and plasters; and the spirit of turpentine is applied externally as a counter irritant, and has the reputation of being a very valuable medicine in the cure of the tapeworm and inflammation of the serous membranes, and in the form of an enema it is very useful in some affections of the rectum, &c.

CLASS XXII.

DIOECIA.

(*Stamens and Pistils in separate flowers, on different plants*).

ORDER I.

DIAN'DRIA. (*Stamens one to five, mostly two*).

GENUS I. SA'LIX.*—LINN. *Willow Sallow and Osier*.

Nat. Ord. SALICIN'EÆ. RICHD.

GEN. CHAR. *Flowers in catkins, the scales imbricated, and a gland surrounds the stamens and ovary. Barren flowers with from two to five stamens, sometimes the anthers are united. Fertile*

* The genus *Salix* comprises a numerous and most difficult tribe of plants. They are trees and shrubs, but mostly the latter, varying in height from two inches to fifty or sixty feet. They are principally confined to the temperate parts of Europe and America; all have round flexible branches, simple deciduous leaves, with a pair of stipules at the base of the footstalks, the catkins appearing early, and are either erect or pendulous. The florets are separate, that is, the barren florets on one plant, and the fertile on another of the same species. They are generally quick growing plants, though some on their native mountains do not increase more than an inch during the year. The wood is light, soft, and as well as many other parts of the plant applied to numerous useful purposes, as particularized under the different species. Sir W. J. Hooker, after speaking of the utility of these plants, says, "A correct knowledge of the species, then, is of primary importance; no less to the cultivator than to the botanist, yet," says this talented and experienced author, "there is not in the whole range of the vegetable creation a genus liable to more variation at different periods of growth, in different soils and situation, and under different circumstances, so that the accurate determination of its species has baffled the researches of the ablest botanists." The arrangement of the genus under different heads or groups, and the fixing the bounds of the species and their varieties are difficulties which all botanists have encountered in this genus, difficulties arising not only from the variations of the different parts of the same species, growing under various circumstances, but according to Koch., form, "the great number of hybrids, the existence of which in the genus *Salix*, no one can doubt." The most esteemed systems of arranging this genus are that of Mr. Borrer, as given in Hooker's *British Flora*, ed. 3rd and 4th, and of whom Sir W. J. Hooker remarks, "No one has ever studied the willows, whether in a growing or a dried state, more deeply, or with a less prejudiced mind;" and that of Professor Koch. in his pamphlet, *De Salicebus Europæis Commentatis*, published 1828, and followed by Lindley

flowers with two *stigmas*. *Fruit* a one celled *follicle*, with a gland at the base. *Seeds* covered with down, *radicle* inferior.—Name from *sal*, near; and *lis*, water, in Celtic.

Group 1. *Purpureæ*. Koch. Borrer. (*Monandræ*, Br. Fl.) *Filament one, with a double anther, or in S. rubra forked upwards, and bearing two anthers. Trees of low stature or shrubs, with twiggly branches, and more or less lanceolate and serrated leaves, often broader upwards. Catkins very compact.*

1. *S. purpurea*, Linn. (Fig. 1475) *Bitter Purple Willow*. Monandrous catkin sessile, bracteated at the base; capsules ovate, sessile, downy; style short; stigma ovate, nearly sessile; leaves lanceolate, broader upwards, attenuated below, serrated, smooth, decumbent.

English Botany, t. 1388.—English Flora, vol. iv. p. 187.—*Salicetum Woburnense*,* p. 1. t. 1.—Hooker, British Flora, ed. 4. vol. i. p. 354.—Lindley, Synopsis, p. 232

A small *shrub*, from three to four feet high, with long slender smooth branches, widely spreading, often trailing on the ground, of a rich purple, somewhat glaucous hue. *Leaves* linear lanceolate, with a short footstalk, broader, and sharply serrated upwards, with an acute point, somewhat tapering at the base, a deep glaucous green above, very glaucous beneath. *Catkins* appearing before the foliage, almost sessile, solitary, erect, cylindrical, very dense, bracteated at the base. *Scales* obovate, hairy, black, tipped, *gland* small, opposite the scale. *Stamen* solitary, with a four celled *anther*. *Style* very short. *Stigmas* ovate, small, obtuse, thick, persistent. *Capsule* ovate, hoary.

Habitat.—Meadows between Thorpe and Norwich; Eskdale, Melrose.

Shrub; flowering in March.

The long slender shoots of this plant are much esteemed for the finer kind of basket work. It is frequently planted in Norfolk, Suffolk, and some parts of Essex, "for platting into low close fences, to keep out hares and rabbits, the leaves and bark being so intensely bitter, that those animals will not touch either. The twigs, more-

in his Synopsis of the British Flora. We have adopted the former system, as seeming the best suited to our present knowledge of the limits of the species and their varieties; but we have given the arrangement of Koch, at the end of our descriptions, that the student may have the advantage of both systems before him.

* This is an admirable work by his Grace the Duke of Bedford, of which we are sorry to say only a very limited number have been printed. It illustrates by figures and descriptions all the British Willows known at the time of its compilation, besides many exotic species. The arrangement of the "*Salicetum*," is that of Mr. Forbes, head gardener, at Woburn.



1475

Salix purpurea.



1476

Salix Helix.



1477

Salix Lambertiana.



1478

Salix Woolgariana.



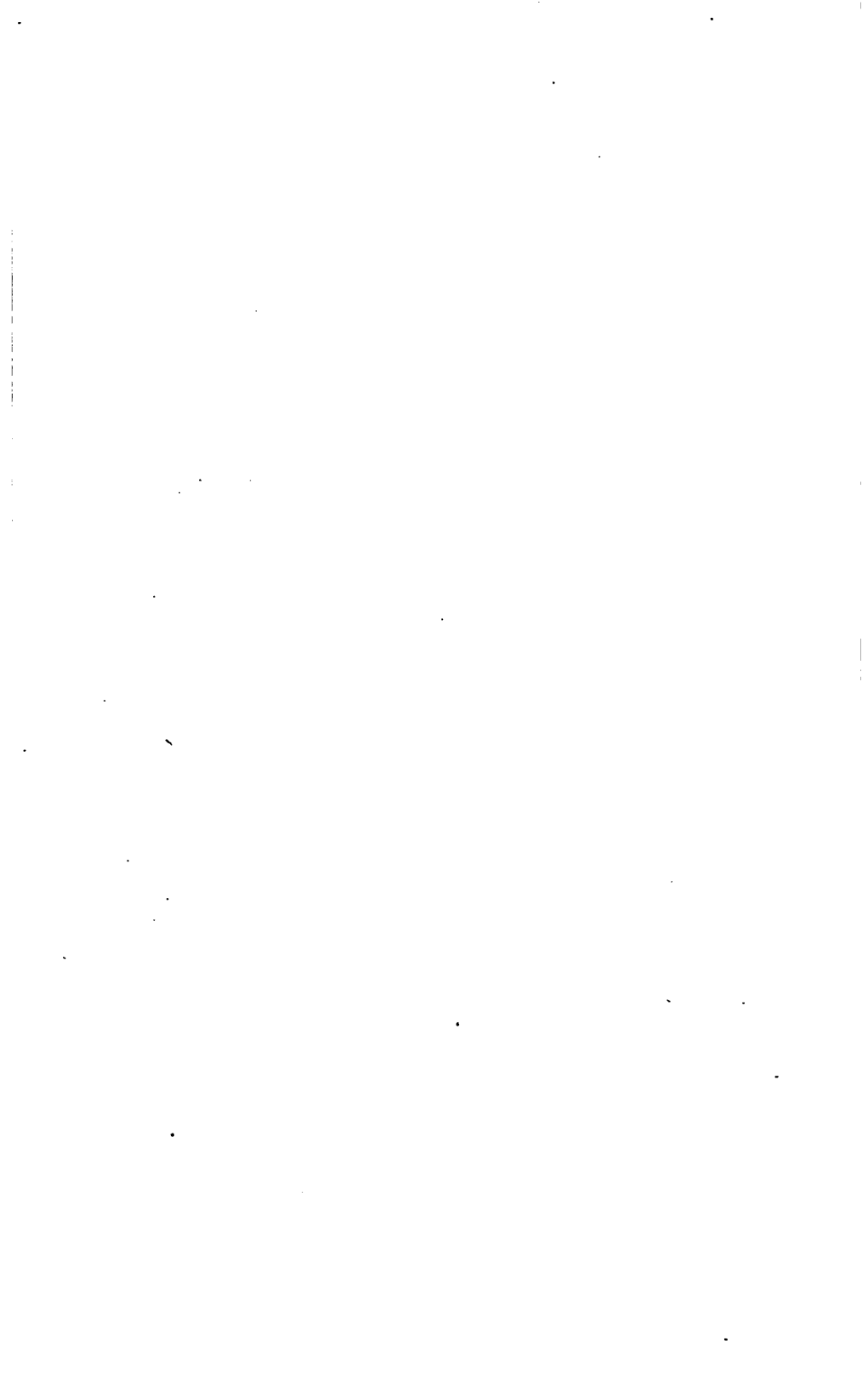
1479

Salix Forbiana.



1480

Salix rubra.



over, are so long, tough, and flexible, that they may be interwoven into any shape, and kept close to the ground, as they always retain their horizontal mode of growth. Such a fence is scarcely inferior to one made of wire, and is, perhaps, more durable, as continually producing young shoots to supply the place of those that decay."—*Eng. Flora*. From the bark of this species, as well as the following and some others, a white salt in small scales has been obtained, having a very bitter taste, with something of the aroma of the Willow bark; to this salt the name of *Salicin* has been given. From the trials which have been made with it in the hospitals at Paris, in cases of intermittent fever, in the doses of six grains; it has been found to answer the purpose of sulphate of Quinine, three doses arresting the progress of the fever. Besides this salt, the bark, according to Sir H. Davy, contains as much tanning principle, as that of the Oak bark, he found it to abound most in *S. purpurea*, *S. Russelliana*, and *S. alba*. From the bitter and tanning properties of these plants it will be understood why it is that they are the most valuable for basket work, thatch bands, &c., as they are unpalatable to insects, and less liable to decay from the tanning they contain, and planted in hedge rows, cattle will not browse upon them for the same reason.

2. *S. Helix*, Linn. (Fig. 1476.) *Rose Willow*. Monandrous, erect; catkins sessile, bracteated at the base; capsules oblong, ovate, sessile, very pubescent; styles short; stigmas almost linear, emarginate; leaves lanceolate, broadest upwards, attenuated below, serrated, smooth.

English Botany, t. 1343.—English Flora, vol. iv. p. 188.—Salicet. Wob. p. 3. t. 2.—Hooker, British Flora, ed. 4. vol. i. p. 354.—*S. purpurea*, γ.—Lindley, Synopsis, p. 232.

A tree of about ten feet high, erect, with smooth erect branches, and the bark of a pale yellowish or purplish ash colour. *Leaves* similar to the last, though rather less glaucous, and turning like the former to a purplish black in drying. *Catkins* erect, bracteated at the base. *Styles* very short, with two spreading *stigmas*, deeply cleft into linear lobes. *Capsules* oblong, ovate, sessile, about as long or longer than the scale, very downy.

Habitat.—Marshes and banks of rivers.

Low tree; flowering in March and April.

The common name of *Rose Willow* given to this plant is from the rose-like expansions, which are often found on the ends of the branches, formed of a number of small deformed leaves, arranged not unlike the petals of a rose. This monstrosity is caused by an insect depositing its eggs in the summit of the twigs, and which, in consequence of the irritation produced, causes them to throw out these excrescences.

The more erect mode of growth, and the linear lobed stigmas, are the only characters by which this can be distinguished from the last species. It possesses similar properties, and is applied to the same uses.

3. *S. Lambertiana*, Smith. (Fig. 1477.) *Boyton Willow*. Monandrous, erect; catkins sessile, bracteated at the base; capsules oblong, ovate, sessile, very downy; style very short; stigma ovate, emarginate; leaves obovate, lanceolate, serrated, smooth.

English Botany, t. 1359.—English Flora, vol. iv. p. 189.—Salict. Wob. p. 5. t. 3.—Hooker, British Flora, ed. 4. vol. i. p. 354.—*S. purpurea*, β .—Lindley, Synopsis, p. 232.

This is very similar to the last species, and is distinguished only by its broader lanceolate leaves, not tapering at the base, but rounded; the twigs too are mostly of a purplish hue, and the catkins are broader, with a short style and two lobed obtuse stigma.

Habitat.—Banks of the Willy at Boyton; Wilts, Suffolk, Norfolk, &c., and near Edinburgh.

Low tree; flowering in March and April.

4. *S. Woollgaria*, Borr. (Fig. 1478.) *Mr. Woollgar's Willow*. Monandrous, erect; catkins sessile, bracteated at the base; capsules ovate, sessile, downy; style very short; stigmas ovate, scarcely emarginate; leaves lanceolate, wedge shaped, serrated, smooth.

English Botany, t. 2651.—Hooker, British Flora, ed. 4. vol. i. p. 355.—*S. monandra*, Salict. Wob. p. 7. t. 4. (excl. the syn. of Hoffm., except that of t. 1. f. 1)—*S. Monandra*, var. Hoffm. Sal. v. 1. p. 21. t. 1. f. 1.—*S. purpurea*, γ .—Lindley, Synopsis, p. 232.

A shrub or small tree, ten to fifteen feet high, with erect branches, having often opposite twigs, with a smooth polished yellowish grey bark. Leaves broader and shorter than the last species, and more wedge-shaped at the base. Catkins erect, about an inch and half long, soft and silky, in other respects it is similar to *S. Lambertiana*. The style is very short, thick, and stigmas short, rounded, scarcely notched lobes, of yellowish or reddish colour.

Habitat.—About Lewes, Sussex, in osier-holts, "but scarcely wild." At Kingston-upon-Thames, "apparently wild."

A low tree or shrub; flowering in May.

This is named in compliment to Mr. Woollgar, a gentleman who devoted much time to the study of the genus *Salix*, "who supplied Sir J. E. Smith with several of his Willows, and who formed his opinion upon the (above) species from long and accurate observations." He gave it the name of *S. cuneifolia*, from the shape of the leaves.

5. *S. Forbya*, Smith. (Fig. 1479.) *Fine Basket Osier*. Monandrous, erect; catkins sessile, bracteated at the base; capsules ovate, sessile, downy; styles as long as the linear divided stigmas; leaves

oblong lanceolate, serrated, smooth, with a pair of small downy lanceolate stipules at the base.

English Botany, t. 1844.—English Flora, vol. iv. p. 191.—Salic. Wob. p. 9. t. 5.—Hooker, British Flora, ed. 4. vol. i. p. 355.—*S. rubra*, β .—Lindley, Synopsis, p. 232.

A low *bush*, with erect, smooth, slender, tough, and flexible branches, the bark a greyish green. *Leaves* lanceolate, on a short footstalk, about three inches long, a fine green above, glaucous beneath, and somewhat downy beneath when young. *Stipules* small, lanceolate, downy, often wanting. *Catkins* similar to *S. Helix*.

Habitat.—Meadows and osier holts, especially in the Eastern part of England.

Shrub ; flowering in April.

This species, though resembling *S. Helix* in the form of its catkins and fruit, is readily distinguished from that species by its larger lanceolate leaves. The plant is much cultivated in osier-holts for its twigs, which are greatly esteemed for making the finer kind of basket works. "The name," Forbyana, Sir J. E. Smith, says, "may serve to commemorate the original discoverer, or more especially his brother, the Rev. Robert Forbes, an able botanist."—*Eng. Bot.* The leaves turn almost black when dried.

6. *S. rubra*, Huds. (Fig. 1480.) *Green leaved Osier*. Stamens two, combined at the base ; catkins sessile, bracteated at the base ; capsules ovate, sessile, downy ; style elongated ; stigmas linear, undivided ; leaves linear lanceolate, acuminate, serrated, smooth, green on both sides, those of the fertile plants broader ; stipules linear.

English Botany, t. 1145.—English Flora, vol. iv. p. 191.—Salic. Wob. p. 11. t. 6.—Hooker, British Flora, ed. 4. vol. i. p. 355.—Lindley, Synopsis p. 232.

A small *tree*, with long erect smooth branches, of a greyish or purplish colour, tough and pliant. *Leaves* long, linear lanceolate, narrow, with an acuminate point, minutely toothed or serrated on the margin, smooth, a fine grass green, paler beneath, the footstalk short, smooth. *Stipules* linear, awl-shaped, soon falling away. *Catkins* erect, the barren ones stout, obtuse, more than an inch long, the *fertile* ones narrower and shorter. *Scales* obtuse, dark coloured in the upper half, downy. *Stamens* two, upon a single combined filament. *Capsule* ovate, downy. *Style* elongated, the *stigmas* ovate, obtuse, entire.

Habitat.—Low meadows and osier-holts, but rare ; Maidenhead, Windsor, near Salisbury, Cambridgeshire, Carlisle ; frequent in Scotland in hedges and osier grounds.

Small tree ; flowering in April and May.

The twigs, when annually cut, are very valuable for basket work, &c. It is readily distinguished from the other species of this group by its narrow leaves and combined stamens.

Group 2. *Triandræ*. Borr. *Stamens three. Leaves lanceolate, approaching to ovate, with evident deciduous stipules, serrated, glabrous. Catkins lax. Germens stalked, mostly glabrous.*

Most of the species constitute excellent osiers, and become trees if left to themselves.

7. *S. undulata*, Ehrh. (Fig. 1481.) *Sharp leaved triandrous Willow.* Triandrous, catkins on leafy stalks; scales downy, bearded at the point; capsules ovate, conical, stalked; style long; stigmas bifid, linear; leaves lanceolate, acuminate, finely serrated, downy, becoming smooth; stipules half cordate.

Hooker, British Flora, ed. 4. vol. i. p. 356.—Lindley, Synopsis, p. 231.—*S. lanceolata*, Smith.—English Flora, vol. iv. p. 168.—English Botany, t. 1436.—Salicet. Wob. p. 27. t. 14.

An erect bushy tree, about ten feet high, casting its bark every year; the branches round, smooth, greenish brown, slightly downy when young. *Leaves* lanceolate, with an acuminate point, finely serrated with glandular teeth, downy when young, becoming smooth, bright green above, paler beneath, footstalks with a pair of half heart-shaped small stipules at the base, soon falling away. *Catkins* on leafy stalks, appearing with the leaves from one to two inches long. *Scales* membranous, oblong, downy, bearded at the notched apex. *Capsules* elevated on slender stalks, about twice as long as the gland at the base, ovate, conical, mostly smooth. *Style* long. *Stigmas* two, long, bifid.

Habitat.—Near Lewes, Sussex, and in Angussshire, Scotland.

A small tree; flowering in April and May.

The branches and twigs of this plant are annually cut down, but they are much less elastic than many of the other species, and are applied only to the uses of making crates, hampers, and the larger kinds of basket work, and for these purposes it is not stripped of its bark

8. *S. trian'dra*, Linn. (Fig. 1482.) *Long leaved triandrous Willow.* Triandrous; catkins on leafy stalks; scales smooth at the point; capsules oblong, ovate, smooth, stalked; style very short; stigma spreading, notched; leaves oblong lanceolate, acute, serrated, smooth; stipules small, obtuse, half cordate.

English Botany, t. 1435.—English Flora, vol. iv. p. 166.—Salicet. Wob. p. 29. t. 15.—Hooker, British Flora, ed. 4. vol. i. p. 356.—*S. amygdalina*, æ.—Lindley, Synopsis, p. 231.

An erect tree, growing naturally to the height of twenty to thirty feet, throwing off its bark every autumn, in large scales like the Plane tree, its branches are long, erect, tough, smooth, pliant, with rather brownish bark, very leafy. *Leaves* oblong lanceolate, acutely pointed, smooth, about three inches long, a bright green above, paler beneath, on a channeled footstalk, having at the base when young a



1481

Salix undulata.



1482

Salix triandra.



1483

Salix Hoffmanniana.



1484

Salix amygdalina.



1485

Salix pentandra.



1486

Salix decipiens.

pair of small obtuse half heart-shaped *stipules*, which soon fall away, and often wanting. *Catkins* solitary, terminating the short lateral leafy branches, about two inches long, erect or drooping, its *scales* obovate, obtuse or notched, smooth, or somewhat downy, not bearded with long hairs, as in the last species. *Stamens* three, with long *filaments* and yellow *anthers*. *Capsule* ovate, oblong, smooth, on a footstalk, longer than the gland at its base. *Style* very short. *Stigmas* two, spreading, notched lobes.

Habitat.—Wet woods and osier grounds; common.

Tree; flowering in May and August (Lin.)

This is one of the most commonly cultivated of the Willows as osiers. It is cut down every year, and each spring puts up shoots from eight to ten feet long, tough, pliant, and very white when stripped of the bark, which are extensively used for basket work of all kinds. The cultivation of Willows, when properly managed, is one of good profit. The most important thing in forming an osier bed is the selection of suitable ground; indeed it would appear from the remark of Sang that there are few soils that will not grow Willows; but the best place is a hollow, with a rich vegetable mould, rather moist, and capable of being laid dry, and occasionally soaked with water during the dry summer months is far the most eligible. The spot selected in whatever kind of soil should be deeply trenched and manured with stable dung, and well drained with open gutters, which, if water be at command, can be occasionally filled and emptied as may be required. Shoots of one year's growth of the kind of Willow wished to be cultivated, are cut into pieces of about a foot long, and planted at about eighteen inches apart in rows. In the course of three or four years, as the stocks increase, they will be found to be too crowded, and it will be necessary to thin them by removing every alternate plant. To keep these plants in a healthy and vigorous state it is necessary to attend to their being kept free from weeds by hoeing, and also to clear out the drains two or three times a year from weeds and rubbish. By this means the ground is kept free from the intrusion of many insects injurious to the Willows, and the shoots are more numerous and vigorous. The time for cutting them is in the spring, just when they put out their buds they are in the best condition for peeling.

Several varieties of this species occur in osier holts, one, the *French Willow*, of the Sussex osier grounds, which grows, according to Smith, from twelve to fifteen feet high, with leaves of a bright green, and large yellow catkins, with three or more stamens, twice as long as the scales, its leaves are but half the size of our *triandria*, and with more slender footstalks and larger stipules. This, the same author further observes, Mr. Crowe used to name *S. contorta*, esteeming it a doubtful species, not supposed to be wild in Britain. This,

Sir W. J. Hooker says, is "apparently the *S. Hoppeana*, of Willd. (according to my specimens from Saltzburg), differing only in the notched or retuse bracteas." Mr. Borrer seems to think that it is the *S. triandra*, of Curtis Fl. Lond. British Flora.

The ancient Britons appear to have been famous for their basket works. We find Martial thus alludes to it—

"From Britain's painted sons I came,
And Basket is my barbarous name,
But now I am so modish grown,
That Rome would claim me for her own."

And Lucan, speaking of the use to which the twigs and branches are applied, says—

"The bending Willow into barks they twine,
Then line the work with spoils of slaughter'd kine."

9. *S. Hoffmannia'na*. Smith. (Fig. 1483.) *Short leaved Triandrous Willow*. "Triandrous, leaves shortly and broadly lanceolate, acute, slightly rounded at the base, serrated, glabrous; 'germens stalked, ovate, compressed, glabrous; stigmas nearly sessile.'"—Hooker.

English Flora, vol. iv. p. 168.—Salicet. Wob. p. 31. t. 16.—Borr. in English Botany, Supp. t. 2620.—Hooker. British Flora, ed. 4. vol. i. p. 357.—*S. amygdalina*, &c.—Lindley, Synopsis, p. 231.

"A much branched *shrub*, or crooked *tree*, scarcely exceeding twelve feet. *Bark* of the *stem* and large *branches* deciduous, as in the other triandrous Willows. The humbler growth, the short flat lanceolate *leaves* more rounded at the base, with larger rounded ear-shaped *stipules*, distinguish this plant from *S. triandra*, with which it is said to agree in the fertile *flowers*, as it does in wanting the deep furrows of the young twigs, so remarkable in *S. amygdalina*."—Hooker.

Habitat.—Sides of streams in Sussex (sterile plant), and near Cambridge.

Shrub or *small tree*; flowering in May.

10. *S. amygdalina*, Linn. (Fig. 1484.) *Almond leaved Willow*. Triandrous, catkins on leafy stalks; scales smooth at the point; capsules ovate, conical, obtuse, smooth, on long stalks; style very short; stigmas notched, spreading; leaves oblong, ovate, acute, rounded at the base, smooth, serrated; stipules obtuse, half cordate; young branches furrowed.

English Botany, t. 1936.—English Flora, vol. iv. p. 169.—Salicet. Wob. p. 35. t. 18.—Hooker, British Flora, ed. 4. vol. i. p. 357.—Lindley, Synopsis, p. 231.

A *tree*, when uninjured growing to the height of twenty to thirty feet, casting its *bark* every autumn, its *branches* are round, smooth, and when young deeply furrowed, of a yellowish brown colour, often

purplish. *Leaves* oblong, ovate, acutely pointed, rounded, often obliquely at the base, the footstalks short, thick, channeled, running into a prominent mid-rib, the margin obtusely and somewhat unequally serrated, smooth, a bright green above, paler beneath. *Stipules* ear-shaped, rather large, mostly crenated on the margin. *Catkins* erect, about two inches long, cylindrical, terminating the short lateral leafy branches. *Scales* obovate, obtuse, more or less downy, but not bearded at point. *Stamens* sometimes more than three. *Capsules* ovate, somewhat conical, obtuse, smooth, on a slender foot-stalk, about as long as the scale. *Style* very short. *Stigmas* obtuse, notched, spreading.

Habitat.—Banks of rivers and ditches; Norfolk, Suffolk, Cambridgeshire; Scotland.

Tree; flowering in April, May, and August.

According to Sir J. E. Smith, this tree, if cut down every year, produces rods six to eight feet long, in considerable plenty, fit for coarse basket work, but not equal to *S. triandra* when peeled. Besides other insects the Entomologist will find upon this tree the *Phalana anastomosis*, Linn., the Mocca stone moth, the Caterpillar is of a bright yellow, streaked with brown. They are found collected together in a web, which they attach to the leaves, and are mostly very numerous. It is a native of Europe and America.

Group 3. *Pentandra*. Borr. *Stamens* more than three, usually five, in each catkin, so numerous and long as to render the flowers, which too are in perfection at the same time with the foliage, quite handsome; while the tree itself is the most ornamental of the whole genus. *Germens* smooth. *Catkins* on lateral leafy stalks. Moderately sized trees, with ample glossy fragrant foliage, exuding a resin from the glandular serratures of the leaves.

11. *S. pentandra*, Linn. (Fig. 1485) *Sweet Bay-leaved Willow*. Stamens five or more; catkins on a leafy stalk; capsules tapering, ovate, smooth, on short stalks; styles short; stigma bifid; leaves elliptic lanceolate, acuminate, smooth, with glandular serratures, and several glands at the base; stipules ovate.

English Botany, t. 1805.—English Flora, vol. iv. p. 171.—Salicet. Wob. p. 67. t. 34.—Hooker, British Flora, ed. 4. vol. i. p. 357.—Lindley, Synopsis, p. 280.—*S. Meyeriana*, Borr. not Willd.

A handsome erect tree, growing from fifteen to twenty feet high, the branches compact, with dark glossy bark. *Leaves* numerous, elliptic lanceolate, or ovate, with an acuminate point, a dark smooth shining green above, paler beneath, the margin copiously serrated with glandular teeth, footstalk rather short, channeled, with several glands at the top. *Stipules* ovate, mostly wanting. *Catkins* on short lateral leafy branches, somewhat downy, cylindrical, large, from one and half to two inches long, spreading. *Scales* oblong, obtuse, hairy, yellow. *Stamens* five to ten, with long filaments and yellow anthers.

Capsules ovate lanceolate, smooth, on a short stalk. *Style* short, thick. *Stigmas* deeply cloven, spreading.

Habitat.—Banks of rivers and watery places; most frequent in the North of England and Scotland.

Tree; flowering in May and June.

This is one of our more handsome Willows; its copious large shining leaves give it somewhat the appearance of an evergreen. The glands of the leaves and flowers exhale a resinous odour, something resembling the sweet bay (*Laurus nobilis*), and its large showy catkins appearing later than many other species, renders it a desirable plant for pleasure grounds, especially in wet places or near water. It is less esteemed for the uses of the basket-maker, &c., than many others of the genus. It was, perhaps, a garland made of the branches of this Willow, to which Herrick alludes in these desponding lines—

"A Willow garland thou didst send,
Perfum'd last day to me;
Which did but only this portend,
I was forsook by thee.
Since so it is, I'll tell thee what,
To-morrow thou shalt see
Me wear the Willow, after that
To die upon the tree."

Group 4. *Fragiles*. Borr. Koch. *Stamens* two, catkins on lateral leafy stalks. *Trees* of considerable size, with lanceolate glabrous serrated stipulated leaves, and very lax catkins, with elongated more or less stalked glabrous germens.

12. *S. decipiens*, Hoffm. (Fig. 1486.) *White Welsh or Varnished Willow*. *Stamens* two; catkins on leafy stalks; capsules ovate lanceolate, smooth, stalked; style longer than the cloven stigmas; leaves lanceolate, pointed, smooth, with large inflexed teeth; floral ones partly obovate, and recurved; footstalks somewhat glandular; stipules half heart-shaped.

English Botany, t. 1937.—English Flora, vol. iv. p. 183.—*Salicet. Wob.* p. 57. t. 29.—Hooker, British Flora, ed. 4. vol. i. p. 358.—*S. fragilis*.—Lindley, Synopsis, p. 230.

An erect but not lofty tree, with very smooth highly polished branches, of a clay colour, but those of the present year are of a crimson hue. *Leaves* lanceolate, pointed, very smooth, except when first expanded, serrated, with obtuse somewhat incurved teeth, *footstalks* channeled, glandular above, or bearing two small leaflets. *Stipules* half heart-shaped, mostly serrated, acute, often wanting. *Catkins* long, cylindrical, on lateral short leafy branches, these leaves are mostly more ovate than the rest, recurved. *Scales* oblong, obtuse, downy. *Capsules* ovate lanceolate, smooth, on a short stalk. *Style* thick. *Stigmas* obtuse, cloven, shorter than the style.

Habitat.—Low meadows, moist hedges, and osier grounds in various parts of England; Collington Woods, Edinburgh.

Tree; flowering in May.

This is often cultivated in osier grounds, and when cut down producing for a few years shoots from six to eight feet long; but it is said in a few years these gradually become shorter, and consequently it is less worth cultivating than many other species. It is often mistaken for the following species.

13 *S. fragilis*, Linn. (Fig. 1487.) *Crack Willow*. Stamens two; catkins on leafy stalks; capsules oblong, ovate, smooth, stalked; style short; stigmas bifid, spreading; scales oblong, pubescent, and much ciliated; leaves ovate lanceolate, acute, serrated, smooth; foot-stalks somewhat glandular; stipules half heart-shaped, strongly serrated.

English Botany, t. 1807.—English Flora, vol. iv. p. 184.—Salic. Wob. p. 53. t. 27.—Hooker, British Flora, ed. 4. vol. i. p. 358.—Lindley, Synopsis, p. 230.

“A tall bushy headed *tree*, whose *branches* are set on obliquely, somewhat crossing each other, not continued in a straight line, by which it may be readily distinguished in the winter. They are round, very smooth, with a brown polished *bark*, and so brittle at the base in spring, that with the slightest blow they start from the trunk.”—*Smith*. *Leaves* ovate lanceolate, taper pointed, very smooth, except when young, of a dark shining green, paler beneath, the foot-stalks channeled, and mostly with several glands at the top. *Stipules* half heart-shaped, strongly serrated or toothed. *Catkins* on lateral leafy branchlets, cylindrical, obtuse, about two inches long. *Scales* oblong, concave, very pubescent, and copiously ciliated on the margin. *Stamens* two to five. *Capsules* nearly sessile, oblong, ovate, smooth, somewhat compressed. *Style* short, with deeply divided spreading *stigmas*.

Habitat.—Banks of rivers and marshy places; common.

Tree; flowering in April and May.

The wood of this species, from its being so brittle, is of little value, and, according to Smith, the medical virtues attributed to it belong to the following species. It is a native of Sweden, where the root, boiled for a considerable time, is said to serve the country people for staining eggs of a purple colour. The practice of making presents to friends at Easter of coloured eggs is of ancient date; it is still continued in Scotland, and in the North of England; and we have observed at the period of this festival great numbers of eggs, stained of different colours, exhibited for sale in the shops in various parts of Italy.

Arranged under this group is the *S. Babylonica*, or *Weeping Willow*, so called from its growing near Babylon. It is a native of

Asia, Persia, China, and Africa, but flourishes well in almost all parts of Europe. Various accounts are given as to the time that it was introduced into England; one is, that our poet Pope, happening to be with Lady Suffolk at the time when that lady received a present from Spain, or some say Turkey, and observing that some of the twigs bound round it appeared as though they would grow, took them saying, "Perhaps these may produce something that we have not in England;" and planting one of them in his garden at Twickenham, it became the Weeping Willow, afterwards so celebrated as Pope's Willow, and which became the parent of many others now growing in England. But the proprietor of the villa, a few years since, had it cut down, as he was annoyed by persons asking to see it. The association of objects with the various events of our lives must be familiar to all as the fact, that certain objects do create in the mind trains of thought which, if they had not been seen, might have remained evermore dead to the individual. The Weeping Willow, from its being a tree frequently selected to overshadow the grave of some departed relative or friend, is a familiar instance of this. And what can appeal to the feelings of the Jews more strongly than the Weeping Willow, which may remind them of their Babylonish conquerors leading the daughters of Jerusalem away captive? And how affecting the allusion to these trees in the 137th Psalm—

"By the rivers of Babylon, there we sat down,
Yea, we wept, when we remembered Zion,
We hanged our harps upon the Willows in the midst thereof."

14. *S. Russelliana*, Smith. (Fig. 1488.) *Bedford Willow*. Stamens two; catkins on leafy stalks; capsule ovate lanceolate, smooth, stalked; style as long as the thickish bifid stigmas; scales narrow, lanceolate, slightly pubescent, and ciliated; leaves lanceolate, tapering, strongly serrated, smooth, very pale beneath; stipules obliquely half heart-shaped, tapering, serrated.

English Botany, t. 1808.—English Flora, vol. iv. p. 186.—Salicet. Wob. p. 55. t. 28. and *frontispiece (the tree)*.—Hooker, British Flora, ed. 4. vol. i. p. 358.—Lindley, Synopsis, p. 280.

A handsome *tree*, growing to eighty or ninety feet high, with long straight slender *branches*, tough, round, flexible, with a polished bark. *Leaves* lanceolate, tapering at each end, strongly serrated, with a channeled footstalk, tapering into a stout mid-rib, quite smooth, but somewhat silky when young, a bright green above, very pale beneath, towards the top of the footstalk there are usually several glands, and sometimes small leaflets. *Stipules* obliquely half heart-shaped, strongly serrated, often wanting. *Catkins* on lateral leafy branches, about two inches long, the *scales* narrow lanceolate, with an obtuse point, more or less downy and ciliated. *Capsules* lanceolate, smooth, half as long again as the scale, on a short stalk *Style* as long as the deeply divided spreading *stigmas*.

Salix fragilis.

1487



1868 *Salix Russeliana.*



1489

Salix alba.



1490

Salix vitellina.



1491

Salix petiolaris.



1492

Salix rosmarinifolia.

Habitat.—Moist woods and osier grounds; not unfrequent.
Tree; flowering in April and May.

This, though nearly allied to the last species, it is important to distinguish, as the properties and value are greatly different. The bark, according to the investigation of the late George Biggin, Esq., of Cosgrove Priory, contains a greater proportion of tanning matter than that of Oak bark; and according to Sir J. E. Smith, it is this and not *S. fragilis* which contains the *salicine*, and may be used as a substitute of Quinine. The wood is considered the most useful of the Willow tribe, and its value as a plantation tree may be estimated from the account which Mr. Lowe gives in his survey of the county of Nottingham: he states that the poles yielded a net profit of £214 per acre, and in two years more they would probably have produced £300 per acre. A "tree stood near the public footpath in the fields between the city of Lichfield and Stowe Hill, the residence of the celebrated 'Molly Ashton.'" This was the famous Willow of the celebrated Dr. Johnson, which he, or his father, planted. Such was the delight that he took in this tree that he said it was the joy of his early and waning life, and on his visiting Lichfield he never failed to visit it. Dr. Trevor Jones, a physician at Lichfield, at the request of Dr. Johnson, gave him the following particulars of the tree, as recorded in the Philosophical Transactions. The trunk rose to the height of twelve feet eight five-tenths inches, and then divided into fifteen large ascending branches, which, in very numerous and crowded sub-divisions, spread at the top in a circular form, not unlike the appearance of a shady Oak, inclining a little towards the east. The circumference of the trunk at the bottom was fifteen feet nine five-tenths inches; in the middle, eleven feet ten inches; and at the top immediately below the branches, thirteen feet. The entire height of the tree was forty-nine feet; and the circumference of the branches at their extremities upwards of two hundred feet, overshadowing a plane not far short of four thousand feet. The surface of the trunk was very uneven, and the bark much furrowed. The tree had then (Nov. 29, 1781) a vigorous and thriving appearance. The most moderate computation of its age was at that time near fourscore years; and some respectable authorities were strongly inclined to think that a century had passed over its head." In April, 1810, Dr. Withering found the trunk to girth twenty-one feet at six feet from the ground, and to extend twenty feet in height; before dividing into enormous ramifications it was then perfectly sound and in unimpaired vigour. It was at various periods injured by being blown away with violent storms, and at last in April, 1829, it was blown to the ground by the violence of a storm. The wood was converted into snuff boxes and other articles by the admirers of Johnson, and kept as a remembrance of him, and as a record of so famous a tree. In the same situation another young plant is said to be flourishing from a

branch of the old tree, which had accidentally been used as a pea rod by Mr. Holmes, the proprietor of the ground, and was found to be growing at the time the parent tree was blown down, so that the history of the parent may be remembered by the flourishing of its offspring. Another instance of the great size to which this Willow grows is given by Hooker in the case of one growing at Gordon Castle, Scotland, and which at the age of 61, was fifty seven feet high, and above eleven feet in its greatest circumference.

Group 5. *Albæ*. Borr. *Trees of considerable elevation, having lanceolate serrated leaves, with long silky hairs beneath, especially in a young state, which give to the foliage a light or whitish hue, the serratures glandular. Catkins lax, germens glabrous.*

15 *S. alba*, Linn. (Fig. 1489.) *Common White Willow.* Stamens two; catkins on leafy stalks; capsules ovate, acuminate, nearly sessile, smooth; stigmas nearly sessile, bifid, recurved; scales short, pubescent on the margin; leaves elliptic, lanceolate, regularly glandulous, serrulated, silky beneath, often so above; stipules lanceolate.

English Botany, t. 2430.—English Flora, vol. iv. p. 231.—Salict. Wob. p. 271. t. 136.—Hooker, British Flora, ed. 4. vol. i. p. 359.—Lindley, Synopsis, p. 231.

β. "Under side of the leaves less silky, often quite glabrous."—Hook.

English Flora, vol 4. p. 231.—Hooker, British Flora, ed. 4. vol. i. p. 359.—*S. cærulea*, Blue Willow.—English Botany, t. 2431.—Salict. Wob. p. 273. t. 137.

A rapid growing *tree*, attaining the height of fifty or sixty feet or more, with thick cracked bark, and wide spreading *branches*, downy when young. *Leaves* numerous, lanceolate, broadest above the middle, acutely tapering at each end, white, with close pressed silky hairs beneath, smooth or slightly silky above, footstalk short, channeled, the margins regularly serrated, with glandular teeth. *Stipules* small, lanceolate, or roundish, often wanting. *Catkins* from one to two inches long, on lateral branches, bearing several small leaves. *Scales* oblong, obtuse, somewhat hairy and fringed. *Stamens* with long hairy *filaments* and yellow two celled *anthers*. *Capsule* ovate, more or less acuminate, nearly sessile, smooth. *Stigmas* nearly sessile, thick, spreading, cleft.

Habitat.—River sides, moist woods, &c.; frequent.

Tree; flowering in May.

From the much more rapid growth of the variety *cærulea*, and the darker colour of the young branches and less hairy leaves, it has been thought a distinct species; but these or other characters have not been found sufficiently constant to distinguish it as a species, its properties seem to be the same. The *bark* contains so much tanning matter as to be used in the North of Europe for tanning leather; the

colouring matter is said to dye cotton yarn of a brownish colour, and in France it is used for making a fine red colour, and in the preparing of leather for making gloves. The *inner bark* or *albumen* abounds in the autumn with granules of starchy matter, a substance only formed after the fruits of the plant and growth of the tree are finished for the season, and like the inner barks of the pine and birch it is collected and dried by the poor inhabitants of Norway and Kamtschatka, and ground into flour, and mixed with corn meal to make bread in seasons of scarcity. So abundant is the starchy matter in the bark of some trees, that it may, by being ground and triturated in water be separated in the same way as starch is from potatoes. The *leaves* and young green branches are given as food to cattle, and dried and kept in store for winter fodder. The larger branches are used as stakes, poles, &c., and worked into rakes, hoe handles, and various other implements. The *wood* is white, light, and soft, and is applied to many useful purposes, as lining to carts, barrows, &c., for which and many other purposes it is well adapted, on account of its bruising and not splitting as the harder woods would do, so that by the turner, millwright, and cooper, it is a wood much used for their works. It forms excellent charcoal for making gunpowder, crayons, &c. The twigs are used for basket making; the branches for crates, and split into thin shreds, it is woven into the foundation of silk hats, bonnets, &c.

This tree is commonly planted by river sides, and in marshy districts as a pollard, and in such situations is one of our most rapidly growing trees. The best mode of planting it appears to be the putting of a vigorous young pole, eight feet long, two feet into the soil; this plan seems to succeed better than planting rooted young trees. The starchy matter, we have already observed, abounds in the inner bark and wood of the Willow after the plant has finished growing. Mr. Heyer, in making experiments upon the growth of Willow branches, found that in proportion to the growth of the plant the starch disappeared, and he also made the very interesting observation that such branches as were made to grow in snow water (which contains ammonia), produced roots three or four times longer than those which were made to grow in pure distilled water, and that this pure water remained clear, while the rain water gradually acquired a yellow colour.

As an ornamental tree it is not much esteemed, though in some countries, where the land is low and marshy, it gives it a remarkable character, as well in our own country as in some parts of the Continent, where indeed it is often planted for many miles in long regular lines on each side of the road, and gives a sameness by no means pleasing to the traveller; but on the banks of rivers meandering through a fertile country, it is by no means an unornamental tree, where, as Montgomery says—

"Odours abroad the winds of morning breathe,
And, fresh with dew, the herbage sprang beneath;
Down from the hills that gently sloped away
To the broad river shining into day,
They pass'd; along the brink the path they kept,
Where high aloof o'erarching *Willows* wept,
Whose silvery foliage glisten'd in the beam,
And floating shadows fringed the chequer'd stream."

16. *S. vitellina*, 'Linn. (Fig. 1490.) *Yellow Willow, or Golden Osier*. Stamens two; catkins on leafy stalks; capsules ovate, acuminate, nearly sessile; style short; stigma bifid; scales lanceolate, pubescent; leaves lanceolate, with glandular serratures, silky beneath, often so above; stipules lanceolate.

English Botany, t. 1889.—English Flora, vol. iv. p. 182.—Salic. Wob. p. 39. t. 20.—Hooker, British Flora, ed. 4. vol. i. p. 359.—*S. alba*, β .—Lindley, Synopsis, p. 281.

A handsome *tree*, growing from fifty to seventy feet high, with numerous erect branches, with yellow bark, quite smooth and shining. *Leaves* narrow, lanceolate, tapering at each end, with numerous glandular serratures, a fine smooth green above, glaucous, and more or less silky beneath, in a young state silky on both sides, each on a short footstalk, with small lanceolate *stipules*, soon falling away. *Catkins* on short leafy lateral branches, cylindrical, the barren ones about two inches long, the fertile about an inch, *scales* lanceolate, more or less waved and pubescent. *Stamens* scarcely longer than the scales. *Capsules* sessile, or nearly so, ovate, acuminate, smooth. *Style* very short. *Stigmas* deeply cloven.

Habitat.—Hedges and osier grounds; not unfrequent.

Tree; flowering in May.

This is a handsome tree, remarkable for the yellow colour of its branches, and is sometimes planted in pleasure grounds among evergreens, with which, especially in the winter season, it makes a pleasing contrast. It is cultivated in osier grounds for its slender flexible branches for basket work, &c.

Group 6. *Grisea*. Borrer. *Chiefly shrubs, native of America*.

17. *S. petiolaris*, Smith. (Fig. 1491.) *Dark long leaved Willow*. Catkins on leafy branches; scales rounded, or oblong, notched; capsules ovate lanceolate, stalked, very silky; stigmas divided, nearly sessile; leaves lanceolate, serrated, smooth, when young grey, with silky hairs, especially beneath.

English Botany, t. 1147.—English Flora, vol. iv. p. 181.—Salic. Wob. p. 45. t. 28.—Hooker, British Flora, ed. 4. vol. i. p. 359.

A *shrub* or small *tree*, with slender flexible smooth dark brown or purplish branches. *Leaves* lanceolate, pointed, serrated, smooth, bright green above, glaucous and silky beneath, and when young





1493

Salix angustifolia.



1494

Salix Doniana.



1495

Salix fusca.



1496

Salix ambigua.



1497

Salix reticulata.



1498

Salix glauca.

silky also above, on rather long slender footstalks, with a pair of lanceolate or lunate serrated *stipules* at the base, often wanting. *Catkins* on leafy branches, about an inch long, rather lax. *Scales* rounded, or oblong, notched, hairy. *Capsules* ovate, obtuse, silky, on a long hairy footstalk. *Styles* sessile, or nearly so. *Stigmas* thick, deeply cloven.

Habitat—Angus-shire, Scotland.

Shrub; flowering in April.

This is a very doubtful native; indeed Lindley says that it is not a British nor even a European species. It is remarkable for its very silky capsules and long footstalks. "After gathering, the young leaves especially exhale a strong scent, like the flavour of bitter almonds, but less agreeable."—*Smith*.

Group 7. *Rosmarinifolia*. Borrer. *Small erect shrubs. Leaves linear lanceolate, entire, or with extremely minute glandular teeth. Catkins short, lax. Germens stalked, silky.*

18. *S. rosmarinifolia*, Linn. (Fig. 1492.) *Rosemary leaved Willow*. Catkins sessile, when in fruit placed upon leafy stalks, short, curved, lax; capsules lanceolate, acuminate, downy, on a silky stalk; style short; stigma bifid; scales short, downy; leaves linear, lanceolate, entire, or with distant glandular teeth, silky beneath; stipules lanceolate.

English Botany, t. 1865.—English Flora, vol. iv. p. 214.—*Salict. Wob.* p. 178. t. 87.—Hooker, British Flora, ed. 4. vol. i. p. 860.—Lindley, Synopsis, p. 236.

A slender upright *shrub*, from two to three feet high, with erect slender branches, downy when young. *Leaves* linear lanceolate, narrow, entire, or with distant glandular serratures, the upper surface smooth and green, silky when young, glaucous beneath, and more or less silky, becoming black with drying, *footstalk* short, thick, with an erect rather large obliquely ovate *stipule* at the base. *Catkins* when young sessile, in fruit recurved on a short leafy branch, becoming more erect. *Scales* small, ovate, obtuse, fringed, dark coloured. *Capsule* ovate, lanceolate, densely silky, on a rather long downy stalk. *Style* short, thick. *Stigmas* deeply cloven.

Habitat.—Found by *Sherard*. Sent by Mr. Dickson to Mr. Crowe, probably from Scotland.—*Smith*.

Shrub; flowering in April.

19. *S. angustifolia*, Wulf.? (Fig. 1493.) *Little Tree Willow*. Catkins ovate, erect, on short leafy branches; capsules ovate, acuminate, densely silky, stalked; style thick; stigmas broad, erect, entire; scales obovate, notched, villous, bearded, black; leaves linear, lanceolate, nearly smooth, with minute glandular teeth, when young glaucous and silky beneath.

Hooker, British Flora, ed 4. vol. i. p. 360.—*S. Arbuscula*.—English Botany, t. 1366.—English Flora, vol. iv. p. 198.—Salict. Wob. p. 171. t. 86.—*S. rosmarinifolia*.—Lindley, Synopsis, p. 236.

An erect *shrub* or low *tree*, with erect light brown round spreading branches, silky when young. *Leaves* linear lanceolate, acute at each end, with minute distant teeth, a smooth bright green above, dull, and somewhat glaucous beneath, and more or less silky, with close pressed hairs, when young mostly silky all over, footstalks short, slender, rarely with *stipules* at the base. *Catkins* ovate, hoary, erect, on short stalks, bearing a few lanceolate tapering leaves. *Scales* obovate, obtuse or notched, black or purplish, villous and bearded. *Capsules* ovate, acuminate, densely pubescent, on a short stalk. *Style* short, thick, with large broad thick obtuse entire erect *stigmas*, mostly of a tawny colour.

Habitat.—Highlands of Scotland; Clove Mountains, near Dumfries.

Shrub; flowering in April.

This is nearly allied to the last species. "Still," Sir W. J. Hooker remarks, "I agree with Mr. Borrer in thinking them distinct, though the difference lies almost entirely in their *germens*; these are shorter in the present plant, with denser, less glossy, and less truly silky hairs, with ovate and quite entire *stigmas*, and more shaggy scales." The *S. Arbuscula*, a native of Switzerland, &c., is, we are assured by Mr. Borrer, quite a different plant from the above, for which reason at his suggestion Hooker has given it the name of *S. angustifolia*, as being probable the plant of Wulfen.

Group 8. *Fusca*. Borrer. *Small shrubs, with generally procumbent stems and leaves, between elliptical and lanceolate, mostly silky beneath, nearly entire. Catkins ovate, or cylindrical. Germens silky, striated.*

20. *S. Doniana*, Smith. (Fig. 1494.) *Donian Willow*. Catkins cylindrical, erect, on short leafy branches; capsules ovate oblong, on short stalks, silky; scales obovate, bearded; styles short; stigmas ovate, thick, entire; leaves partly opposite, obovate lanceolate, acute, slightly serrated, livid, and somewhat silky beneath; stipules linear.

English Flora, vol. iv. p. 213.—Borrer in English Botany Suppl. t. 2599.—Salict. Wob. p. 169. t. 85.—*S. purpurea*, a.—Lindley Synopsis, p. 232.

A *shrub* about six feet high, branched from the base, with erect straight round leafy *branches*, of a reddish brown colour, somewhat downy when young. *Leaves* obovate, lanceolate, somewhat serrated towards the point, the margins somewhat recurved, the upper side flat, or slightly convex, a grass green, smooth, without or with a few scattered hairs, livid, and somewhat glaucous beneath, silky and

netted, with prominent veins and a reddish mid-rib. *Stipules* small, linear, serrated, deciduous. *Catkins* appearing before the leaves, cylindrical, erect, about an inch long, becoming elevated on a short leafy stalk. *Scales* obovate, blackish, bearded. *Capsules* ovate oblong, with a short stalk, covered with silky hairs. *Style* short. *Stigmas* small, thick, emarginate, pale, becoming brown.

Habitat.—Scotland.

Shrub; flowering in May.

This species in its general appearance much resembles *S. purpurea*; but Mr. Borrer, as stated in the British Flora, considers it correctly placed in the present division, on account of its stalked *germens*, which have little resemblance to those of *Monandrea*, but are closely analogous with those of *S. fusca*, to which species he thinks there is considerable affinity in the foliage also.

21. *S. fusca*, Linn. (Fig. 1495.) *Dwarf silky Willow*. Catkins sessile when in fruit, elevated on leafy stalks; capsules lanceolate, silky, on a long stalk; style slender; stigmas ovate, bifid; scale ovate, downy, fringed; leaves elliptic, or elliptic lanceolate, acute, entire, or with minute glandular serratures, glaucous, and mostly silky beneath; stipules lanceolate, acute; stem more or less procumbent.

S. repens. Lindley, Synopsis, p. 236.

1. *Leaves oblong, ovate, silky beneath*.

α. Stem much branched, decumbent below.

S. fusca.—English Botany, t. 1986.—English Flora, vol. iv. p. 210.—Salicet. Wob. p. 155. t. 83.—Hooker, British Flora, ed. 4. vol. i. p. 361.—*S. repens*.—English Botany, t. 183.—β. Lindley, Synopsis p. 236.

2. *Leaves broadly oval, or roundish ovate*.

β. Stem recumbent.

S. fatida.—English Flora, vol. iv. p. 208.—*S. adscendens*.—English Botany, t. 1962, and *S. parvifolia*, t. 1961.—Salicet. Wob. p. 159. t. 80. and p. 161. t. 81.—*S. fusca*.—Hooker, British Flora, ed. 4. vol. i. p. 361.—*S. repens*.—Lindley, Synopsis, p. 236.

γ. Stem procumbent.

S. incubacea.—English Flora, vol. iv. p. 212. (exclusive of all the other syn. ? Borr.)—Borrer in English Botany Suppl. t. 2600.—*S. fusca*.—Hooker, British Flora, ed. 4. vol. i. p. 361. var. α.—*S. repens*.—Lindley, Synopsis, p. 236.

δ. Stems erect or spreading, leaves with a recurved point, very silvery beneath.

S. argentea.—English Flora, t. 1364.—English Flora, v. iv. p. 207.—*S. fusca*.—Hooker, British Flora, ed. 4. v. i. p. 361. ζ.—*S. repens*.—Lindley, Synopsis, p. 236.

A low more or less procumbent or creeping shrub, with slender

divided branches, a smooth brownish or yellowish bark. *Leaves* more or less ovate, or elliptic lanceolate, green and smooth, or slightly silky above, glaucous, and mostly silky beneath, with a prominent mid-rib and lateral veins, *footstalk* short, with a pair of lanceolate stipules, often wanting. *Catkins* at first sessile, becoming elevated on leafy branchlets. *Scales* ovate, oblong, obtuse, mostly purplish, pubescent, and fringed. *Capsules* lanceolate, silky, on a long slender footstalk. *Style* short. *Stigmas* ovate, bifid.

Habitat.—Moist and dry places on heaths and moors in sandy situations.

Low shrub ; flowering in April and May.

The appearance of this plant varies considerably, according to the more or less dry or sandy situation in which it has grown. It is not applied to any particular uses.

Group 9. *Ambigua*. Borrer. *Shrubs*.

22. *S. ambigua*, Ehrh. (Fig. 1496) *Ambiguous Willow*. Catkins sessile when in fruit, on a short leafy stalk ; capsules lanceolate, downy, on long hairy stalks ; styles mostly short ; stigmas ovate, entire, or notched ; scales oblong, with long marginal hairs, leaves oblong, or obovate, entire, or serrated upwards, with a recurved point, downy above, wrinkled with veins, and silky beneath ; stipules half ovate, acute.

English Botany Suppl. t. 2733.—Hooker, British Flora, ed. 4. vol. i. p. 361.—Lindley, Synopsis, p. 236.—“*S. prostrifolia*, Schleich.—*Salix*. Wob. p. 149. t. 75.”

β. major. Stigmas sessile, or nearly so ; leaves obovate, about an inch across, very silky on both sides.

English Botany, Suppl. t. 2733 *β*.—Hooker, British Flora, ed. 4. vol. i. p. 362. *β*.

γ. spathulata. Style elongated ; leaves oblong, about half an inch across, moderately hairy or silky.

English Botany Suppl. t. 2733. *γ*.—Hooker, British Flora, ed. 4. vol. i. p. 362. *γ*.—*S. spathulatata*, Willd.

δ. undulata. Leaves lanceolate ; stipules stalked ; style long ; stigma entire ; capsule on an elongated stalk.

English Botany Suppl. t. 2733. *δ*.—*S. ambigua*, var. *.—Lindley, Synopsis, p. 236.

A low *shrub*, with straggling branches, often procumbent, or rising one or two feet, downy when young. *Leaves* on short footstalks, of a thin texture, more or less clothed with silky pubescence, rugose from the elevated veins beneath, the margin entire, waved, or more or less crenated towards the point, the upper surface dark green, often with a greyish or hoary shade, the under side even when the pubescence has fallen is glaucous. *Stipules* small, half ovate, acute, sessile, or on a short stalk, entire, or with small glandular serratures. *Catkins* cylindrical, about half an inch long, sessile when in flower, becoming

elevated on a short leafy stalk when in fruit. *Scales* oblong, obtuse, thin, pale, with a pink point, more or less clothed with silky hairs, mostly very long. *Capsules* lanceolate or ovate lanceolate, white, with close pressed silky hairs, and elevated on a more or less elongated stalk, often as long or longer than the scales. *Style* mostly very short. *Stigmas* short, thick, entire, or cloven, pale, or of a reddish colour.

Habitat.—*α*. on gravelly heaths, Epping Forest, Hopton, Suffolk, Isle of Staffa; *β*. Bogs near Forfar; *γ*. Epping Forest, Hopton, Suffolk, and between Balnagard and Aberfeldie, Scotland.

Shrub; flowering in May.

This, as will be seen, is a very variable plant, depending on the situation of its growth being dry or wet, and in a more or less elevated or exposed place it is procumbent or ascending, or erect, and varies in the colour of the bark being a paler or darker colour, and smooth or pubescent.

It is remarked by Mr. Borrer in the English Botany Suppl. that *S. ambigua* approaches on the one side to *S. aurita*, with the smallest varieties of which it is most liable to be confounded, and on the other to *S. fusca*; differing from the former by its rugose, less vaulted, and less distinctly serrated leaves, their more delicate texture and less woolly pubescence, and the smaller, flatter, and less oblique stipules; from the latter by its less silvery pubescence, and the more uneven upper surface of its leaves, and their more prominent veins beneath, as well as by some minute characters in the flowers. Koch regards it as a hybrid between the two.

Group 10. *Reticulata*. Borrer.'

The character of this group, according to Borrer's arrangement, is that of the following species.

23. *S. reticulata*, Linn. (Fig. 1497) *reticulated Willow*. Catkins on a long terminal stalk; capsules oblong, ovate, downy, nearly sessile; style short; stigmas bifid; leaves elliptical, orbicular, obtuse mostly smooth, entire, glaucous beneath, remarkably reticulated with veins.

English Botany, t. 1908.—English Flora, vol. iv. p. 200.—Hooker, British Flora, ed. 4. vol. i. p. 362.—Salict. Wob p. 133. t. 67.—Lindley, Synopsis, p. 238.

A short procumbent *shrub*, with short spreading smooth dark brown branches. *Leaves* on long slender *footstalks*, orbicular or elliptic, smooth, dark green above, glaucous beneath, of a firm leathery texture, remarkably netted with prominent veins beneath, and sunk ones above, the margin entire, but occasionally notched at the end, the footstalk is channeled, and sometimes downy near the leaf. *Catkins* solitary at the end of each branch, cylindrical, about an inch long, densely flowered, crowded, reddish, on a long footstalk, downy.

Scales ovate, obtuse, downy, shorter than the sessile *capsules*, which are ovate, often curved, woolly. *Style* very short. *Stigmas* thick, deeply cloven.

Habitat.—Lofty mountains in the North of England, Wales, and Scotland.

Shrub; flowering in June and July.

This beautiful little species of Willow is very distinct from all the others, and when cultivated, it forms tufts thickly interwoven together of considerable extent, and of great beauty. It is frequent on the mountains of Switzerland, and Sir W. J. Hooker says he has specimens from Arctic America, with long silky hairs on both sides of the leaves. In our native specimens the young leaves are often found so, but this pubescence soon falls away.

Group 11. *Glaucæ*. Borr. Small, erect, very closely allied shrubs, remarkable for their soft and silky oblong lanceolate leaves, often white and cottony beneath. *Germens* sessile, very downy or silky.

24. *S. glau'ca*, Linn. (Fig. 1498.) *Glaucous Mountain Willow*. Catkins on leafy stalks; capsules elliptic, ovate, narrow, very downy; stigmas nearly sessile, bifid; leaves ovate lanceolate, entire, downy, white, very cottony beneath; stipules ovate, acute, straight.

English Botany, t. 1810.—English Flora, vol. iv. p. 201.—Salic. Wob. p. 135. t. 68.—Hooker, British Flora, ed. 4. vol. i. p. 362.—Lindley, Synopsis, p. 237.

A *shrub*, from two to three feet high, bushy, spreading, with numerous short round brown or yellowish branches. *Leaves* elliptic lanceolate, or ovate, about two inches long, acutely pointed, broader at the base, entire, a smooth glaucous green above, very white and cottony beneath, with prominent veins and pinkish mid-rib. *Stipules* ovate, acute, often wanting. *Catkins* on short lateral downy branches, bearing mostly two leaves, erect, cylindrical, dense, many flowered. *Scales* ovate, very hairy, black, tipped. *Capsules* when young sessile, becoming elevated on a short stalk, ovate, thickly covered with soft pubescence. *Style* short, becoming elongated. *Stigmas* linear, deeply cloven.

Habitat.—Highland of Scotland; Clove Mountains.

Shrub; flowering in July.

25. *S. arena'ria*, Linn. (Fig. 1499.) *Downy Mountain Willow*. Catkins sessile, when in fruit on a short stalk; capsules sessile, lanceolate, downy; style long, slender; stigmas linear, often entire; scales acute, very silky; leaves oblong lanceolate, entire, downy, especially beneath; stipules half heart-shaped, recurved at the point.

English Botany, t. 1809.—English Flora, vol. iv. p. 204.—Salic. Wob. p. 169. t. 1809.—Hooker, British Flora, ed. 4. vol. i. p. 362.—*S. limosa*, Wahl.—Lindley, Synopsis, p. 237.



1499

Salix arenaria.



1500

Salix Stuartiana.



1501

Salix viminalis.



1502

Salix stipularis.



1503

Salix Smithiana



1504

Salix ferruginea.



A *shrub*, from one to two feet high, with dark brown shining bark. *Leaves* oblong lanceolate, acute, entire, white and silky when young, becoming green above, and reticulated with veins beneath, very white and silky, *footstalks* short, thick, channeled. *Stipules* mostly wanting. *Catkins* at first sessile when in fruit, elevated on a short stalk, bearing two or three small leaves, the barren ones short, thick, ovate, the fertile ones cylindrical, about an inch and half long. *Scales* ovate, acute, blackish, copiously bearded. *Capsule* sessile, lanceolate, or somewhat ovate, downy, with a long slender *style*, and linear, entire, or bifid *stigmas*.

Habitat.—Highland Mountains of Scotland, especially those of Breadalbane and Clove.

Shrub ; flowering in June.

26. *S. Stuartia'na*, Smith. (Fig. 1500.) *Small leaved Shaggy Willow*. Catkins sessile when in fruit, on a short stalk ; capsules sessile, lanceolate, very woolly ; style long, slender ; stigmas capillary, deeply divided ; scales acute, very silky ; leaves ovate lanceolate, acute, nearly entire, shaggy above, silky beneath, woolly.

English Botany, t. 2586.—English Flora, vol. iv. p. 203.—Salicet Wob. p. 143. t. 72.—Hooker, British Flora, ed. 4. vol. i. p. 363.—*S. limosa*, var.—Lindley, Synopsis, p. 237.—*S. Lapponum*, Walker.

A *shrub*, from two to three feet high or more, much branched, the bark dark brown, smooth, silky at the top when young. *Leaves* much smaller than those of the last species, lanceolate, acutely pointed, entire, or slightly waved or toothed, sometimes they are ovate lanceolate, a greyish green above, and clothed with glossy silky hairs, the under side white, densely silky or cottony, with obscure veins, and a prominent reddish mid-rib, *footstalk* slender, shaggy. *Catkins* sessile, ovate oblong, becoming elevated on short leafy stalks. *Scales* ovate, acute, almost black, silky, and densely bearded. *Capsule* sessile, ovate oblong, or lanceolate, clothed with woolly pubescence, crowned with a slender *style* as long as itself. *Stigmas* filiform, divided to the base, very long, recurved.

Habitat.—Breadalbane Mountains, Scotland.—Rev. Dr. Stuart.
Near the upper end of the burn of Fioselarig.

Shrub ; flowering in August.

Of this species it is remarked by Sir W. J. Hooker, "I regret that, often as I have visited the Breadalbane Mountains, I have not been able to distinguish *S. Stuartina* from the preceding" (*S. arenaria*).

Group 12. *Viminalis*. Borr. Koch. *Trees of more or less considerable size, with long pliant branches and lanceolate leaves. Germens nearly sessile, hairy or silky, their styles elongated, their stigmas linear, mostly entire.*

27. *S. viminalis*, Linn. (Fig. 1501.) *Common Osier*. Catkins sessile, with bracteas at the base ; capsules lanceolate, downy, nearly

sessile; style long; stigmas long, linear, mostly entire; scales ovate, bearded; leaves linear lanceolate, entire, or obscurely crenated, silky, with white shining hairs beneath; stipules small, linear.

English Botany, t. 1898.—English Flora, vol. iv. p. 228.—Salicet. Wob. p. 265. t. 133.—Hooker, British Flora, ed. 4. vol. i. p. 363.—Lindley, Synopsis, p. 232.

A low *tree*, with straight erect branches, long, slender, round, smooth, clothed with fine silky hairs when young. *Leaves* linear lanceolate, acute, entire, or somewhat waved or crenated, four to six inches long, and about half an inch wide, green, smooth and even above, white, with close silky pubescence beneath, the lateral veins short, slender, the mid-rib prominent, reddish. *Stipules* linear lanceolate, entire, or toothed, often wanting. *Catkins* sessile, oblong, cylindrical, dense, with a few bracteated scales at the base. *Scales* small, ovate, obtuse, or acute, brown, downy, and bearded with white silky hairs. *Capsule* lanceolate, or somewhat ovate, downy. *Styles* short, stigmas linear, acute, spreading, entire, or cleft.

Habitat.—Wet places and osier grounds; frequent.

Tree; flowering in April and May.

This is an extremely quick growing plant, putting out numerous wand-like branches, which are much valued for basket making, &c., for which purpose it is in many of the swampy districts extensively cultivated. Its cultivation and manner of growth and management does not differ from the plan already described. It is not unlikely to have been this plant which Ovid describes, when speaking of the situation in which Willows grow—

“A hollow vale where watery torrents gush,
Sinks in the plain; the osier and the rush,
The marshy sedge and bending willow, nod
Their trailing foliage o'er the oozy sod.”

28. *S. stipularis*, Smith. (Fig. 1502.) *Auricled Osier*. Catkins sessile, with bractees at the base; capsules ovate lanceolate, downy, stalked; style long; stigmas long, linear, undivided; scales oblong, acute, downy, fringed; leaves linear lanceolate, entire, or waved, white and downy beneath; stipules large, half heart-shaped, tapering, often with a lobe at the base.

English Botany, t. 1214.—English Flora, vol. iv. p. 230.—Salicet. Wob. p. 363. t. 132.—Hooker, British Flora, ed. 4. vol. i. p. 363.—Lindley, Synopsis, p. 233.

A *shrub*, with tall erect *branches*, of a pale reddish brown, very brittle. *Leaves* numerous, erect, from four to six inches long, linear lanceolate, acutely pointed, entire, or somewhat waved or crenated on the margin, the upper surface green, soft, scarcely downy, beneath white and downy, with a prominent pale mid-rib and slender lateral veins, *footstalk* about half an inch long, stout, channeled, with a pair

of *stipules* at the base, half heart-shaped, mostly with a lobe at the base, waved or crenated on the margin. *Catkins* ovate oblong, nearly sessile, with a few leafy scales at the base, appearing before the leaves. *Scales* pale at the base, brown at the point, ovate oblong, acute, bearded with long silky hairs. *Capsule* ovate lanceolate, downy, nearly sessile, crowned with a short *style*, and long linear spreading mostly entire *stigmas*.

Habitat.—Osier holts, hedges, and woods; near Bury St. Edmund's. Shrub; flowering in March.

This species is readily distinguished "at first sight by its coarse tall habit and conspicuous stipules, but not worthy of cultivation for any economical purpose."

29. *S. Smithia'na*, Willd. (Fig. 1503.) *Silky legged Osier*. Catkins sessile, with bractees at the base; capsules ovate lanceolate, downy, on a short stalk; style long; stigmas as long, filiform, deeply divided; leaves lanceolate, obscurely crenated, or entire, white, with silky pubescence beneath; stipules small, narrow, acute.

English Flora, vol 4. p. 229.—Salict. Wob. p. 267. t. 234.—Hooker, British Flora, ed. 4. vol. i. p. 363.—*S. mollissima*.—English Botany, t. 1509.—*S. acuminata*, var. β .—Lindley, Synopsis, p. 233.

A shrub, with long round erect smooth branches, with reddish bark, soft and downy when young. *Leaves* lanceolate, three to four inches long, the margin entire, waved, or slightly toothed, especially towards the tapering point, green above, with a coat of very short soft hairs, white, and very silky beneath, the mid-rib prominent, reddish, the lateral veins slender. *Stipules* small, linear, slightly toothed and hairy. *Catkins* appearing before the leaves, small, numerous, sessile, or nearly so, with a few leafy bractees at the base. *Scales* obovate, dark brown at the point, clothed with long silky hairs. *Capsules* ovate lanceolate, silky, on a short stalk, crowned with the short style, and deeply divided filiform stigmas.

Habitat.—Meadows and osier grounds; about Bury, Glamorgan-shire, near Warrington, and in Scotland.

Shrub; flowering in April and May.

The branches are very brittle, consequently not fitted for basket work, so that it is important to distinguish it from others when planting osier grounds.

30. *S. ferrugin'ea*, And. MSS. (Fig. 1504.) *Ferruginous Willow*. Catkins on a short leafy stalk; capsule ovate lanceolate, densely silky, on a short stalk; style about as long as the oblong stigma; leaves thin, lanceolate, the margin waved, and finely toothed, minutely hairy on both sides, paler beneath; stipules small, half ovate.

English Botany, Suppl. t. 2665.—Salict. Wob. p. 255. t. 128.—

Hooker, British Flora, ed. 4. vol. i. p. 364.—*S. cinerea*, δ .—Lindley, Synopsis, p. 234.

A *shrub* about twelve feet high, with spreading branches, the bark of the younger shoots yellowish brown, downy when young. *Leaves* of a thin texture, soft and flexible when young, becoming rigid, of a pale green above, somewhat reticulated with sunk veins, more hairy, paler, and often of a rusty colour beneath, the lower ones obovate, obtuse, with a short point, and almost entire, the rest lanceolate, acute, more or less waved, and with irregular small glandular teeth, the footstalk short, slender, downy. *Stipules* small, half heart-shaped, on a short stalk, toothed, often recurved. *Catkins* cylindrical, on a short thick stalk, bearing at its base a few small leaves. *Scales* oblong lanceolate, dark brown at the point, silky. *Capsule* ovate lanceolate, very silky, on a short silky stalk. *Style* about as long as the pale oblong mostly entire *stigmas*.

Habitat.—Near Carlisle, Fifeshire, Banks of the River Thames near Windsor, Reading, &c., and near Nuthurst, Sussex.

Shrub; flowering in April and May.

This *Salix*, observes Mr. Borrer, considerably resembles *S. cinerea* and *S. oleifolia*, of Smith, but seems still more nearly allied to *S. Smithiana*.

31. *S. acuminata*, Smith. (Fig. 1505.) *Long leaved Willow*. Catkins sessile, bracteated at the base; capsules ovate, hairy, stalked; style as long as the undivided stigma; leaves oblong lanceolate, pointed, waved, and finely toothed, glaucous and downy beneath; stipules half ovate, becoming kidney-shaped.

English Botany, t. 1434.—English Flora, vol. iv. p. 227.—Salicet. Wob. p. 261. t. 131.—Hooker, British Flora, ed. 4. vol. i. p. 364.—Lindley, Synopsis, p. 233.

A *tree*, mostly of humble growth, with erect or but slightly spreading branches, downy when young. *Leaves* oblong lanceolate, with an acute point, from three to four inches long, and about one broad, mostly somewhat rugged, nearly flat, the margin more or less waved and finely serrated, the upper side green, the under pale, glaucous when young, soft, with fine pubescence, the mid-rib and lateral veins prominent, reddish, as well as the stout footstalk. *Stipules* half ovate, becoming half heart-shaped, glaucous, and ribbed at the back, notched on the margin. *Catkins* sessile, becoming somewhat stalked, and bearing several small bracteated leaves. *Scales* obovate, black towards the point, bearded with long hairs. *Capsule* ovate, clothed with silky hairs, and elevated on a hairy stalk, half as long as itself. *Style* short. *Stigmas* thick, entire.

Habitat.—Moist woods and hedges; frequent.

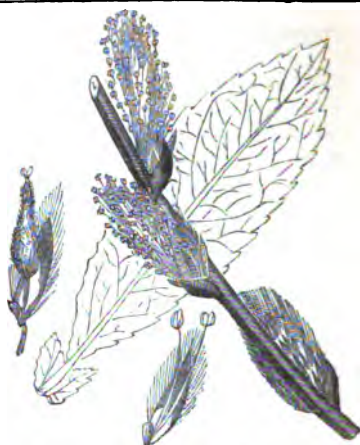
Tree; flowering in April.

Mackay states that this tree grows in several parts of Ireland, and



1606

Salix acuminata.



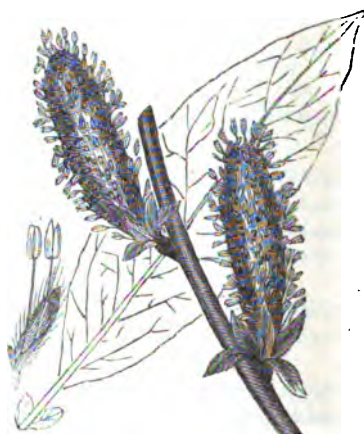
1608

Salix cinerea.



1607

Salix aquatica.



1609

Salix oleifolia.



1610

Salix aurita



1611

Salix caprea.

that at Florence Court he collected specimens in the autumn of 1833, from a plant which has become a tree of about twenty feet high, although growing in an elevated situation.

32. *S. holosericea*, Willd.? *Soft shaggy-flowered Willow*. "Leaves lanceolate, acuminate, serrated, glabrous above, pale, downy, and strongly veined beneath; catkins cylindrical; germens stalked, densely clothed with silky wood; stigmas ovate, sessile; scales (black) very shaggy."—Hooker.

Hooker, British Flora, ed. 4. vol. i. p. 364.—Willd. Sp. Pl. vol. iv. p. 708 ?—Bluff et Fing. Fl. Germ. vol. ii. p. 565.—Lindley, Synopsis, p. 233.

"This is a plant which Mr. Borrer received from Sir J. E. Smith, marked *S. acuminata*, var. *rugosa*; but which he thinks probably allied to the *S. holosericea*, of Willd, and distinguishes it from the true *acuminata*, by its sessile pale coloured stigmas and leaves greener and more rugose above, and more strongly veined beneath. Mr. Forester says that Mr. Crowe regarded it as a variety of *S. Smithiana*, or as an undescribed species."—Hooker.

Habitat.—About Lewes, Sussex.

Tree; flowering in April and May.

Group 13. *Cinerea*. Borr. *Trees or low shrubs, with downy branches, and mostly obovate, grey, hoary, toothed, more or less wrinkled and stipuled leaves, very veiny beneath. Germens sericeo-tomentose*.—The plants of this group are commonly called *Sallows*.

33. *S. cinerea*, Linn. (Fig 1506.) *Grey Sallow*: Catkins sessile, with scaly bractea at the base, appearing before the leaves; capsules lanceolate, with an ovate base, downy, stalked; style short; stigma ovate, mostly entire; leaves elliptical, or lanceolate, obovate, a greyish green above, pubescent, and reticulated with veins beneath, the margin with wavy serratures; stipules kidney-shaped.

English Botany, t. 1897.—English Flora, vol. iv. p. 215.—Salic. Wob. p. 249. t. 125.—Hooker, British Flora, ed. 4. vol. i. p. 364.—Lindley, Synopsis, p. 233.

A tree, growing from twenty to thirty feet high, with crooked branches, and smooth reddish brown bark, downy when young. *Leaves* obovate or elliptic, ovate, or more or less lanceolate, entire, or more or less waved and serrated, with the margin slightly recurved, a greyish green, and nearly smooth above, paler beneath, more pubescent, and reticulated with elevated veins, the *footstalks* slender, without *stipules*, except on the young vigorous shoots they are half heart-shaped, becoming kidney-shaped, serrated on the margin. *Catkins* appearing before the leaves, sessile, with several scaly bractea at the base, thick, obtuse, silky, about an inch long. *Scales* lanceolate, the upper half dark brown, silky, and thickly bearded. *Capsules*

lanceolate, with an ovate base, clothed with a silky pubescence, and elevated on a silky stalk. *Style* short, thick. *Stigma* ovate, entire or deeply cleft.

Habitat.—Banks of rivers, and in moist woods; common.

Tree; flowering in April.

This is one of the least ornamental and useful of the tribe; but from its flowering before most other trees, it is worn on Palm Sunday by Roman Catholics, in commemoration of that day, in the absence of the real palm branches: and it may have been this Willow which was in the hands of those who followed in the profession, that suggested to Wordsworth on a Sunday morning in the vale of Chamouny the idea that

"The Hebrews thus carrying in joyful state
Thick boughs of palm and willows from the brook,
Marched round the altar—to commemorate
How, when their course they through the desert took,
Guided by signs which ne'er the sky forsook,
They lodged in leafy tents and cabins low,
Green boughs were borne, while for the blast that shook
Down to the earth the walls of Jericho,
These shout hosannas,—these the startling trumpets blow!"

34. *S. aquatica*, Smith. (Fig. 1507.) *Water Sallow*. Catkins sessile, with scaly bractea at the base, appearing before the leaves; capsules ovate lanceolate, silky, stalked; stigmas nearly sessile; leaves obovate, elliptical, minutely downy, flat, somewhat glaucous beneath, slightly serrated; stipules rounded, toothed.

English Botany, t. 1437.—English Flora, vol. iv. p. 218.—Salicet. Wob. p. 253. t. 127.—Hooker, British Flora, ed. 4 vol. i. p. 365.—*S. cinerea*, β .—Lindley, Synopsis, p. 233.

A bushy *shrub* or low *tree*, with numerous erect branches when young, hoary, often angular, with reddish brown bark. *Leaves* soft and pliant, of a dull greyish green, reticulated with fine veins, not rugged, becoming quite smooth above, glaucous and downy beneath, elliptic oblong, acute or obovate, rounded and obtuse, about two inches long and one broad, the margins more or less serrated, especially towards the point. *Stipules* rounded, toothed, small. *Catkins* appearing before the leaves, sessile, or nearly so, with several bractea scales at the base. *Scales* obovate, dark purple in the upper half, very silky. *Capsules* ovate lanceolate, silky, on a short hairy stalk. *Style* very short. *Stigmas* thick, ovate, entire.

Habitat.—Watery places in woods, hedges, banks of rivers and pools; frequent.

Shrub or small *Tree*; flowering in April.

This is related to *S. cinerea* and *S. oleifolia*; but the leaves are broader, of a thinner texture, and are without the rusty hue apparent

on the leaves of those species. The wood is so brittle that it is not applicable to any economical purposes.

35. *S. oleifolia*, Smith. (Fig. 1508.) *Olive leaved Sallow*. Catkins sessile, with scaly bractea at the base, appearing before the leaves; capsules ovate lanceolate, silky, stalked; leaves obovate, lanceolate, flat, rather rigid, minutely toothed, acute, glaucous, reticulated, and finely hairy beneath; stipules very small, rounded, deeply notched.

English Botany, t. 1402.—English Flora, vol. iv. p. 219.—Salict. Wob. p. 251. t. 126.—Hooker, British Flora, ed. 4. vol. i. p. 365.—*S. cinerea*, γ.—Lindley, Synopsis, p. 233.

A tree, with rounded branches and brown bark, angular and hoary when young, the buds are very large before expanding. *Leaves* two to three inches long, and about one in breadth, of an elliptic lanceolate form, tapering at each end, the margin nearly entire, or serrated, with minute glandular teeth, green, flat, and even above, and slightly hoary, paler, and somewhat glaucous beneath, minutely hairy, and reticulated with prominent veins, and becoming by age of a somewhat rusty hue, of a firm substance rather than coriaceous, and when young densely downy, footstalks rather short, downy. *Stipules* very small, rounded, recurved, deeply notched, often wanting. *Catkins* large, thick, sessile, with several small bracteated hairy scales at the base. *Scales* obovate, oblong, the upper half dark, purplish, black, hairy, the *stamens* with long slender filaments, and ovate golden yellow *anthers*.

Habitat.—Abundant in Norfolk, about Tunbridge, and not unfrequent in other parts of England and Scotland.

Tree; flowering in March.

This is a very doubtful species, as well as the two preceding, so much so that Mr. Borrer, as stated in British Flora, says, "I do not venture to unite the three, although I could never satisfy myself as to their characters. They all vary much in foliage and in fructification."

36. *S. anrta*, Linn. (Fig. 1509.) *Round-eared Sallow*. Catkins sessile when in fruit, stalked, with a few leaves at the base; capsules lanceolate, with an ovate base, downy, stalked; style very short; stigmas ovate, emarginate; leaves obovate or oblong-obovate, rugose and downy above, glaucous and hairy beneath, tipped with a small recurved point, the margins with wavy serratures; stipules kidney-shaped, toothed.

English Botany, t. 1487.—English Flora, vol. iv. p. 216.—Salict. Wob. p. 247. t. 124.—Hooker, British Flora, ed. 4. vol. i. p. 365.—Lindley, Synopsis, p. 234.

A bushy *shrub*, three or four feet high, with long spreading or trailing branches, roundish, dark brown or purplish, downy when young. *Leaves* of various sizes, each on a short downy footstalk, obovate, and contracted at the base, or oblong, and rounded at the base,

rugose, with reticulated veins above, and slightly downy, pale glaucous, and almost woolly beneath with a prominent mid-rib, and lateral veins, the apex of the leaf has often a remarkable broad curved point, and the margins are often recurved, more or less waved and serrated. *Stipules* half heart-shaped, convex, strongly winged and serrated, stalked, sometimes wanting. *Catkins* appearing before the leaves, sessile, becoming elevated on a short leafy stalk when in fruit. *Scales* oblong lanceolate, thin bearded, the upper half brownish. *Capsule* lanceolate, tapering, from an ovate base, downy, elevated on a hairy stalk. *Style* very short. *Stigmas* ovate, thick, often notched.

Habitat—Moist woods and thickets; abundant.

Shrub; flowering in May.

The leaves of this plant often produce remarkable rosaceous tufts, like those of *S. Helix*. It is a variable plant, especially in the size of the leaves, which are sometimes very small, and at others large, and the plant is more or less erect or spreading.

37. *S. caprea*, Linn. (Fig. 1510.) *Great round leaved Sallow*. Catkins sessile, with bracteated scales at the base, appearing before the leaves; capsules lanceolate, tapering from an ovate base, stalked, downy; stigmas sessile, undivided; leaves ovate or elliptic, acute, the margin more or less waved and crenated, smooth above, glaucous and downy beneath; stipules kidney-shaped.

English Botany, t. 1488.—English Flora, vol. iv. p. 225.—Salicet. Wob. p. 243. t. 122.—Hooker, British Flora, ed. 4. vol. i. p. 365.—Lindley, Synopsis, p. 234.

An erect moderate sized *tree*, round branches, with brown or purplish bark, downy when young. *Leaves* large, broad, a deep green, with a downy mid-rib, white, a glaucous beneath, netted, with prominent veins, and more or less clothed, with white cottony pubescence, their form is various, but mostly ovate, approaching orbicular, with an acute point, and varying in length from two to three inches, the margin is wavy, and more or less strongly serrated, *foot-stalk* stout, downy, variable in length, sometimes almost an inch long. *Stipules* also various in size, kidney-shaped, serrated, ribbed, and glaucous beneath. *Catkins* numerous, appearing sometimes before the leaves, sessile, with several bracteated scales at the base, large, oblong, dense, erect. *Scales* obovate, almost black, very hairy. *Capsules* lanceolate, tapering, from an ovate base, downy, becoming smooth. *Style* very short. *Stigmas* thick, ovate, entire.

Habitat.—Woods and pastures; common.

Tree; flowering in April and May.

The name *caprea* seems to have been given to this species, from the reputed fondness of goats for the catkins: the many flowered branches of this species, like those of *S. cinerea*, are called palms,





1511

Salix sphaecolata.



1512

Salix ootnifolia.



1513

Salix hirta.



1514

Salix nigricans.



1515

Salix Andersoniana.



1516

Salix Forsteriana.

and are used for the same purpose on Palm Sunday, in the Roman Catholic ceremonies of that day. The bark, from its containing much tanning matter, is used by the Highlanders of Scotland for tanning matter; and it has been used as a tonic in the cure of ague in the place of Peruvian bark. The wood is light, soft, smooth, and white, and is applied to many useful purposes; the branches are flexible and durable, and are used for making hurdles, &c. Bees are very fond of the early flowers, and they resort to it in great numbers. It will grow in either wet or dry situations, and is one of the best trees of the genus for making fences.

38. *S. sphacelata*, Smith. (Fig. 1511.) *Withered-pointed Sallow*. "Stem erect; leaves elliptic-ovate, even veiny, entire, or slightly serrated, downy on both sides, discoloured at the point; stipules half heart-shaped, toothed, erect; germens stalked, ovate lanceolate, silky; stigmas notched, longer than the style."

English Botany, t. 2333.—English Flora, vol. 4. p. 224.—Salict. Wob. p. 241. t. 121.—Hooker, British Flora, ed. 4. vol. i. p. 265.—*S. caprea*, β.—Lindley, Synopsis, p. 234.

"A small bushy tree, six or eight feet high, the young branches very soft, with dense hoary short velvety like down. Leaves in like manner soft and downy, especially when first opening, always of a greyish aspect, their shape obovate, or elliptical, with a small oblique point, their length an inch and half, perhaps two or two and half at their full growth, the margin either quite entire, slightly, sparingly, and unequally serrated, the upper side light green, clothed with fine down, which finally di-appears, under side more downy, with a prominent rib and veins, hoary, not glaucous, the tip from its earliest formation nearly naked, green, or brownish, soon looking as if blasted or withered, assuming a tawny hue. The footstalks are shortish, thickly downy. Stipules half heart-shaped, toothed, erect, green, and smooth, never large, often wanting. Catkins on short hairy stalks, with several ovate, sessile, not large, bractees densely silky at the back, barren ones about an inch long, cylindrical, not half the size of *S. caprea*, fertile, somewhat larger and stouter, finally measuring full an inch and half. Scales of both obovate, downy, and bearded, black in their upper half. Nectary oblong, abrupt, constricted in the middle. Stamens twice as long as the scales, with roundish pale yellow anthers. Germens lanceolate, silky, on a hairy stalk, as long as the scale. Style very short. Stigma thick, either undivided or notched, not deeply cloven. Capsules light, reddish brown, somewhat silky or downy."—Smith.

Habitat.—Finlarig, near the head of Loch Tay.—*Rev. Dr. Stuart*. Tree; flowering in April and May.

Of this species it is remarked by Sir W. J. Hooker, that "with this species I am unacquainted, and Mr. Borrer doubts if it be a good species."

Group 14. *Nigricanthes*. Borr. A group as difficult to define as

are the species which compose it. Many approach the last division very nearly, having more or less ovate or obovate leaves, but they are less wrinkled, and, when dry, generally become black, whatever care may be taken in the preservation of them.—Shrubs with long branches, or small trees. GERMENS glabrous, or silky, stalked. Style more or less bifid.

39. *S. cotinifolia*, Smith. (Fig. 1512.) Quince leaved Sallow. Catkins sessile when in fruit, elevated on a short leafy stalk; capsule lanceolate, acuminate, stalked; style long; stigmas bifid; leaves elliptical-orbicular, obsoletely toothed, slightly downy above, more so and glaucous and veiny beneath; stipules small, roundish, or ovate.

English Botany, t. 1403.—English Flora, vol. 4 p. 220.—Salict. Wob. p. 227. t. 114.—Hooker, British Flora, ed. 4. vol. i. p. 366.—*S. phylicifolia*.— β . Lindley, Synopsis, p. 234.

A low shrub, with straight erect round branches, with brown bark downy when young. Leaves broadly elliptical, almost orbicular, with a rounded obtuse base and broad short point, flat, from an inch to an inch and half long, the margin finely serrated, mostly with glandular teeth, a dull green, and scattered over with minute hairs above, more hairy, paler, and somewhat glaucous beneath, with a prominent midrib and lateral veins, footstalk stout, downy. Stipules small, roundish ovate, soon falling away, and often wanting. Catkins appearing before the leaves, erect, cylindrical, sessile, becoming elevated on a short stout leafy stalk. Scales obovate, blackish towards the point, bearded with long hairs. Capsule ovate lanceolate, silky, on a hairy stalk. Style thick, rather long. Stigmas linear, obtuse, notched.

Habitat.—Woods and thickets, Norfolk, and near Glenluce and Forfar; Scotland.

Shrub; flowering in April and May.

The leaves of this species are of a firm, rather rigid texture, resembling in their outline those of the *Rhus cotinus*, hence its specific name, they become black with drying.

40. *S. hirta*, Smith. (Fig. 1513.) Hairy branched Sallow. Catkins sessile, becoming elevated on short leafy stalks; style bifid; stigmas capitate, emarginate; leaves elliptic, heart-shaped, pointed, downy on both sides, finely crenate; stipules half heart-shaped, flat, toothed, nearly smooth.

English Botany, t. 1404.—English Flora, vol. iv. p. 221.—Salict. Wob. p. 225. t. 113.—Hooker, British Flora, ed. 4. vol. i. p. 366.—*S. phylicifolia*.— β . Lindley, Synopsis, p. 234.

A small erect tree, with round thick branches, densely clothed with white cottony pubescence, which is thick, close, and soft. Leaves elliptic oblong, obtuse, or somewhat heart-shaped at the base, from two to three inches long, and about one inch in width, with an acute point, the margin with shallow serratures, or obtusely crenated, of a dull green, and minutely hairy beneath, pale, somewhat glaucous, and

densely downy, the mid-rib and lateral veins prominent and reticulated, *footstalk* stout, very downy. *Catkins* appearing before the leaves, sessile, becoming elevated on short leafy stalks. *Scales* obovate, or lanceolate, very silky, almost black in the upper half. *Stamens* with large yellow *anthers*, or long *filaments*. *Style* shortly bifid. *Stigmas* notched, thick, capitate.

Habitat.—Woods and hedges; Norfolk, Castle Eden, Yorkshire.

Small tree; flowering in April and May.

41. *S. nigricans*, Smith. (Fig. 1514.) *Dark broad leaved Willow*. Catkins sessile, becoming elevated on short leafy stalks; "capsules ovate lanceolate, silky; style smooth, longer than the stigmas;" leaves elliptic lanceolate, acute, smooth, with a downy rib above, glaucous, and nearly smooth beneath, unequally crenated; stipules obliquely heart-shaped, crenated, smooth, veiny.

English Botany, t. 1218.—English Flora, vol. iv. p. 172.—Salic. Wob. p. 73. t. 37.—Hooker, British Flora, ed. 4. vol. i. p. 366.—*S. phyllifolia*.—β.—Lindley, Synopsis, p. 234.

A large bushy *shrub*, with erect round shoots, somewhat brittle, downy when young. *Leaves* elliptic lanceolate, with an acute point, and often rounded or unequal at the base, a dark green, and smooth, except the mid rib above, glaucous, and somewhat hairy beneath, with a prominent mid-rib and lateral veins, the margin more or less regularly crenated, from two to three inches long, and about one inch broad, the *footstalk* stout, downy, channeled, dilated at the base. *Stipules* obliquely heart-shaped, crenated, veiny, smooth, about half the length of the footstalk, often wanting. *Catkins* appearing before the leaves, sessile, becoming elevated on short leafy branches. *Scales* obovate, downy, the upper half dark brown. "Fertile catkins on the (Lapland specimens) two inches long when fully grown. *Germen* awl-shaped, downy, on a short thick downy stalk. *Style* smooth, longer than the *stigmas*, permanent like them. *Capsules* ovate lanceolate, silky, of two recurved, light brown valves. *Seed* obovate, polished, with a copious woolly crown."

Habitat.—Fens, at Wromsey, Norfolk; near Shobden Court, Herefordshire.

Shrub; flowering in April.

The fertile plants of this species do not appear to have been found wild in Britain. The leaves turn black in drying, and, according to Smith, the plant is not applied to any useful purposes.

42. *S. Andersonia'na*, Smith. (Fig. 1515.) *Green Mountain Sallow*. Catkins sessile, becoming elevated on short leafy stalks; capsules linear, awl shaped, smooth, on a slender stalk; style long, bifid at the extremity; stigmas bifid; scales oblong, fringed; leaves elliptic oblong, acute, slightly crenato-dentate, scarcely downy above, glaucous beneath; stipules small, sub-ovate.

English Botany, t. 2343.—English Flora, vol. iv. p. 223.—*Salicet. Wob* p. 217. t. 109.—Hooker, *British Flora*, ed. 4. vol. i. p. 366.—*S. phyllicifolia*.—Lindley, *Synopsis*, p. 234.

A bushy *shrub*, with curved dirty brown coloured branches, slightly downy when young. *Leaves* of a bright green above, and nearly smooth, paler, or somewhat glaucous, and more downy beneath, with a prominent mid-rib and lateral veins, elliptic oblong, acutely pointed the margin crenato-dentated. *Stipules* small, sub ovate, entire, or toothed. *Catkins* at first sessile, becoming elevated on short leafy stalks. *Scales* oblong, purplish, fringed with long silky hairs. *Capsules* linear, awl-shaped, with an ovate base, smooth. *Style* long, cleft at the top. *Stigmas* bifid, downy.

Habitat.—Sides of streams; among the Breadalbane Mountains, Scotland, and Banks of the Tyne, below Newcastle.

Shrub; flowering in May and June.

43. *S. Damascena*, *Forbes*. *Damson leaved Willow*. "Young shoots densely hairy; leaves ovate, or rhomboidal, bluntly toothed, silky when young, at length nearly naked, green on both sides; stipules half heart-shaped; catkins (in flower) longer than the floral leaves; scales obovate; germen stalked, naked; style divided, longer than the diverging stigmas."—*Borrer*.

English Botany Suppl. t. 2709.—*Forbes* in *Salicet. Wob*. p. 285.—Hooker, *British Flora*, ed. 4. vol. i. p. 367.—*S. phyllicifolia*.—Lindley, *Synopsis*, p. 234.

This species, it is remarked by Mr. *Borrer*, is "perhaps too nearly allied to *S. Andersoniana*, to be properly regarded as a species. In that plant the leaves, especially the lower ones, are more oblong, and their under side is not so absolutely devoid of a glaucous tinge; the catkins are shorter, and rarely overtop the larger and generally leaf-like bracteas; the flowers, except that they are more loosely set, and their calyx scales more oblong and blacker, are very nearly the same in structure."

Habitat.—South of Scotland and the Borders.

Shrub; flowering in April.

44. *S. Forsteriana*, *Smith*. (Fig. 1516.) *Glaucous Mountain Sallow*. Catkins sessile, becoming elevated on a short leafy stalk; capsules awl-shaped, with an ovate base, silky; style as long as the blunt emarginate or bifid stigmas; leaves elliptic obovate, acute, slightly downy, glaucous beneath, crenated; stipules rounded, recurved, crenated.

English Botany, t. 2344.—English Flora, vol. iv. p. 224.—*Salicet. Wob*. p. 219. t. 110.—Hooker, *British Flora*, ed. 4. vol. i. p. 367.—*S. phyllicifolia*.—*β*. Lindley, *Synopsis*, p. 235.

A small *tree*, with downy branches. *Leaves* two or three inches long, dark green above, and smooth, except the mid-rib and lateral





1617

Salix rupestris.



1618

Salix petraea.



1619

Salix laurina.



1620

Salix laxiflora.



1621

Salix radicans.



1622

Salix Borreriana.

veins, glaucous, more downy and reticulated beneath, crenated on the margin, the footstalk rather short, thick, downy. *Stipules* rather small, rounded, toothed, recurved, and more or less hairy. *Catkins* sessile, erect, becoming elevated on a short leafy branch, and much elongated. *Scales* obovate, sometimes acutely pointed, blackish in the upper half, silky. *Capsules* lanceolate, awl-shaped, with an ovate base, downy. *Style* rather long. *Stigmas* thick, notched.

Habitat.—Not rare in Scotland.—*Mr. E. Forster*. On the Breadalbane Mountains; Heaton Dene, Banks of the Tyne.

Small tree; flowering in May and June.

Nearly allied to the last species, to which perhaps it ought to be united. The *germens* are more crowded and silky, and the *catkins* longer, and the *leaves* rather darker in colour, but we fear not sufficiently constant to constitute a good species.

45. *S. rupestris*, Donn. (Fig. 1517.) *Silky Rock Sallow*. Catkins sessile, becoming elevated on short leafy stalks; capsules awl-shaped, silky, stalked; style as long as the blunt undivided stigmas; leaves obovate, acute, serrated, flat, silky on both sides; stipules ovate, hairy, small, often wanting; stem trailing; branches minutely downy.

English Botany, t. 2342.—English Flora, vol. iv. p. 222.—Salicet. Wob. p. 221. t. 111.—Hooker, British Flora, ed. 4. vol. i. p. 367.—*S. phyticifolia*.— β . Lindley, Synopsis, p. 234.

Stem with procumbent or trailing branches, with dark coloured bark, minutely downy when young. *Leaves* obovate, elliptic, or acutely pointed, flat, veiny, the margin more or less regularly serrated, minutely silky above, more so beneath, *footstalk* short, rather thick, silky. *Stipules* small, ovate, silky, often wanting. *Catkins* sessile, becoming when in fruit elevated on short leafy branches, and twice as long as when in flower, lax and spreading. *Scales* obovate, obtuse, or acutely pointed, purplish in the upper half, silky and bearded. *Capsules* slender, more or less awl-shaped, with an ovate base, stalked, and minutely silky. *Style* as long or longer than the blunt ovate entire stigmas.

Habitat.—Near Blanchland, Northumberland; Rocks of Craig allach and Mael Ghyrdu, Scotland.

Shrub; flowering in May.

46. *S. petraea*, And. MS. (Fig. 1518.) *Dark green Rock Sallow*. Catkins sessile, becoming elevated and leafy at the base; capsules lanceolate, stalked, smooth, wrinkled towards the point; style divided, longer than the cloven stigmas; leaves oblong, serrated, carinated, and reticulated with deep sunken veins, beneath hairy, glaucous, becoming pale green; stipules large, half heart-shaped, flattish, serrated; branches erect, downy when young.

English Botany t. 2725.—Salicet. Wob. p. 193. t. 97.—Hooker,

British Flora, ed. 4. vol. i. p. 367.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect *shrub*, often growing fifteen feet high, with crooked ash coloured branches, downy when young. *Leaves* oblong, dark green, shining, and slightly hairy above, paler and more hairy beneath, becoming almost smooth, the margins serrated, and often somewhat recurved, more or less keeled, and netted with sunken veins in a rugose manner. *Stipules* large, sessile, serrated, with glandular tipped teeth. *Catkins* sessile, or nearly so, becoming elevated, on short hairy leafy branches, and the catkins much elongated. *Scales* obovate, or oblong, often emarginate, brown in the upper half, scattered over and fringed with silky hairs. *Capsule* lanceolate, with an ovate base, stalked, smooth, wrinkled towards the point. *Style* cloven, about one-third its length. *Stigmas* mostly cloven, thick, spreading.

Habitat.—Breadalbane Mountains, Scotland.

Shrub; flowering in May.

The long dark shining leaves being more or less waved, and the large stipules render this a remarkable looking plant. It is, Mr. Borrer remarks, nearly allied to *S. hirta*, and still more perhaps to *S. stylaris*, of Seringe.

47. *S. propinqua*, Borr. (Fig. 1519.) *Flat leaved upright Mountain Willow*. "Erect young shoots, minutely pubescent; leaves elliptical, obscurely crenated, nearly flat, with slightly sunken veins, nearly naked on both sides, pale green beneath; stipules small, vaulted, glandulose; germens stalked, silky towards the point; style longer than the notched stigmas."—Borrer.

Borrer in English Botany Suppl. t. 2729.—Hooker, British Flora, ed. 4. vol. i. p. 368.—*S. arbuscula*, var.—Lindley, Synopsis p. 235.

"Finding in this some apparently distinctive characters, we venture, after much hesitation, to add another presumed species to a section of the genus, of which almost every species is doubtful."—Borrer.

Habitat.—"Discovered in Britain by Mr. Anderson."

Shrub; flowering.

Group 15. *Bicolores*. Borr. *Leaves smooth, or nearly so, dark green above, very glaucous beneath, between obovate and lanceolate. Germens very silky. Twiggy bushes.*

48. *S. tenuior*, Borr. *Narrow leaved intermediate Willow*. "Leaves on slender stalks, obovate lanceolate, acute, obscurely crenate, flat, naked on both sides, glaucous beneath; stipules acute, glandulose; catkins slender, lax; calyx scales acute, longer than the silky stalk of the capsule; style longer than the ovate stigmas."—Borrer.

English Botany Suppl. t. 2650.—Hooker, British Flora, ed. 4. vol. i. p. 368.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

This species, Mr. Borrer observes, "Sir J. E. Smith appears to have joined with *S. laurina*, (*S. bicolor*, Eng. Bot. t. 1806.) the specimens of the present Willow, which were communicated to him. The branches are of laxer growth than in *S. laurina*, the twigs paler, the leaves more spreading, on longer and less dilated stalks, narrower, more acute at the base, less downy when young, and the short hairs of the under side less persistent. *Catkins* shorter, and much more slender, especially in their advanced state, when the stalk of the capsule, although lengthened, does not, as in that species, equal or exceed the scale, the scale itself being longer and more acute, the capsule too is less grey, with more silky and more closely appressed pubescence."—*Borrer*.

Habitat.—By the river Lochy, near Killin, in Breadalbane, Scotland.

Shrub; flowering in May.

49. *S. lauri'na*, Smith. (Fig. 1520.) *Shining dark green Willow*. *Catkins* when in fruit on elongated leafy stalks; catkins awl-shaped, from an ovate base, on a long footstalk, downy; style short; stigma ovate, bifid; leaves elliptic oblong, acute, waved, entire, or remotely toothed, nearly smooth above, glaucous beneath, on dilated footstalks; stipules kidney-shaped, serrated.

Hooker, British Flora, ed. 4. vol. i. p. 368.—*S. bicolor*.—English Botany, t. 1806.—English Flora, vol. iv. p. 178.—Salicet. Wob. p. 75. t. 38.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect *shrub* or low *tree*, with round dark brown branches, downy when young. *Leaves* numerous, from two to three inches long, and about one in breadth, elliptic oblong, with an acute point, the margins slightly waved, entire, or unequally toothed towards the point, of a full dark shining green above, and nearly smooth, glaucous beneath, with a prominent downy mid-rib and lateral veins, *footstalks* short, broad, downy. *Stipules* small, often wanting, half heart-shaped or kidney-shaped, serrated, downy. *Catkins* when in fruit on an elongated downy leafy stalk. *Scales* oblong, obtuse, brown in the upper half, and bearded with long hairs. *Capsules* narrow, lanceolate, or awl-shaped, from an ovate base, very silky, on a rather long footstalk.

Habitat.—Woods and thickets in various parts of England.

Shrub or low *tree*.

This species appears to be unfit for any particular uses. It is not so ornamental as many of the others, and from its branches being brittle, it cannot be applied to the purposes of many of the other plants in basket making, &c.

50. *S. laxiflora*, Borr. (*Loose flowered Willow*). "Upright,

young shoots slightly pubescent; leaves naked, flat, broadly obovate, narrowed at the base, slightly toothed, glaucescent beneath, upper ones acute; stipules small, concave; catkins loose; germen stalked, bluntish, naked in the lower part; style as long as the linear divided stigma."—*Borrer*.

English Botany Suppl. t. 2749.—Hooker, British Flora, ed. 4. vol. i. p. 388.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

A small tree or shrub, with crooked spreading branches, with shining twigs, of a greyish green colour, often tinged with brown. *Leaves* from one to one and a half inches long, of a bright shining green above, more or less glaucous beneath, of a thin texture, with minute glandular teeth, or entire, quite smooth, the *footstalk* slightly downy. *Stipules* small, ovate, or half cordate, mostly concave, the edges and disk glandulous. *Catkins* about an inch long when in flower, on thick hairy stalks, with a few small floral leaves, soon falling away, flowers loosely set. *Scale* oblong, mostly rounded, silky, black in the upper half. *Germen* rounded, and bulging at the base, contracted in the middle, and again rather enlarged towards the somewhat blunt apex, the lower part naked, the upper beset with white appressed shining hairs, its stalk more or less hairy, about half as long as the scale. *Style* about half as long as the germen, naked. *Stigmas* scarcely as long as the style, deeply cleft into spreading linear segments, pale, soon turning brown. (See English Botany Suppl. t. 2749.)

Habitat.—Killin, in Breadalbane, Scotland.

Shrub or low *tree*; flowering in April.

"This Willow resembles *S. laurina* in the figure of the leaves; but that plant differs by its more acute angled ramifications, its mahogany coloured twigs densely cottony while young, the abundance of the short appressed hairs on both surfaces of the young leaves, the more subulate germen white all over, with cottony hairs, and the shorter style with short stigmas, the segments of which usually adhere together."—*Borrer*.

51. *S. radi-cans*, Smith. (Fig. 1521.) *Tea leaved Willow*. Catkins leafy at the base, becoming elevated on elongated stalks; capsules lanceolate, downy, with an ovate base, stalked; style elongated; stigmas entire, or bifid; leaves obovate or elliptic-lanceolate, smooth; glaucous beneath, the margin with wavy serratures.

Hooker, British Flora, ed. 4. vol. i. p. 388.—*S. phylli-cifolia*.—English Botany, t. 1958.—English Flora, vol. iv. p. 173.—Salicet. Wob. p. 91. t. 46.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

A low spreading *shrub*, with brown or purplish recumbent branches, taking root from the joints. *Leaves* mostly elliptic lanceolate, about two inches long, and less than one broad, on short stalks, smooth, a dark green above, glaucous beneath, and quite smooth,

except on the mid-rib, the margin more or less crenated, with wavy notches. *Stipules* small, half ovate, somewhat glandular on the disk, soon falling away. *Catkins* about two inches long when in fruit, rather lax, with an elongated footstalk, with several floral leaves towards the base. *Scale* linear, oblong, hairy, brown in the upper half, smooth or silky. *Capsule* lanceolate, slender from an ovate base, silky, on rather a long stalk. *Style* about as long as the notched spreading *stigma*s.

Habitat.—Breadalbane Mountains; Scotland.

Shrub; flowering in May.

52. *S. Borreria'na*, Smith. (Fig. 1522.) *Borrerian Willow*. Catkins becoming elevated on a short leafy stalk; capsules lanceolate, awl-shaped, on long smooth stalks; style long, bifid; stigmas linear, bifid; scales acute, shaggy; leaves broadly lanceolate, with shallow nearly even serratures, smooth and glaucous beneath; stipules lanceolate, small.

English Botany, t. 2619.—English Flora, vol. iv. p. 174.—Hooker, British Flora, ed. 4. vol. i. p. 369.—Salicet. Wob. p. 89. t. 45.—*S. phyllifolia*, var.—Lindley, Synopsis, p. 234.

A much branched *shrub*, from eight to ten feet high, with numerous short spreading twigs, downy at first, becoming smooth, and of a dark brown colour. *Leaves* lanceolate, about two inches long, and about half an inch wide, dark green above, glaucous or bluish beneath, with a prominent mid-rib and reticulated veins, the margin with shallow mostly even glandular teeth, on shortish downy footstalks. *Stipules* obliquely lanceolate, with small glandular teeth, often wanting. *Catkins* becoming elevated on short leafy stalks, *scales* oblong, acute, silky, fringed on the margin, brown in the upper half. *Capsules* lanceolate, awl-shaped, smooth, on long stalks, styles long, bifid, *stigmas* linear, bifid, spreading.

Habitat.—Highland Mountain Valleys; Glen Nevis and Breadalbane.

Shrub; flowering in April.

53. *S. Davallia'na*, Smith. (Fig. 1523.) *Davallian Willow*. Catkins on short leafy stalks; capsules narrow, lanceolate, from an ovate base, stalked; style as long as the bifid stigmas; leaves obovate lanceolate, acutely pointed, obscurely toothed or serrated, smooth, glaucous beneath, the footstalks and young shoots downy; stipules minute.

English Botany Suppl. t. 2709.—English Flora, vol. iv. p. 175.—Hooker, British Flora, ed. 4. vol. i. p. 369.—Salicet. Wob. p. 98. t. 47.—*S. hastata*, Linn.—Lindley, Synopsis, p. 235.

A bushy *shrub*, about six feet high, with erect smooth brown branches, downy when young. *Leaves* obovate lanceolate, sharp pointed, tapering at the base, about an inch and half long, smooth,

except along the mid-rib of the younger ones, the margin serrated, with glandular teeth, dark green and shining above, glaucous, and reticulated with veins beneath, *footstalk* slender, downy above. *Stipules* small, mostly wanting. *Catkins* on short stalks, leafy. *Scales* rounded, or acute, black in the upper half, fringed with long silky hairs. *Capsules* narrow lanceolate, with a rounded base, silky or smooth, on a thickish stalk. *Style* as long as the bifid spreading stigmas.

Habitat.—Brought from Scotland, and cultivated by Mr. G. Anderson.

Shrub ; flowering in May.

54. *S. tetrap'la*, Walk. (Fig. 1524.) *Four ranked Willow*. Catkins scaly stalks ; capsules ovate lanceolate, stalked, smooth ; style as long as the bifid stigmas ; scales oblong, downy ; leaves elliptic oblong, pointed, unequally serrated, nearly smooth, glaucous, with prominent veins beneath ; stipules half arrow-shaped, glandulous.

English Botany, t. 2702.—English Flora, vol. iv. p. 177.—Hooker, British Flora, ed. 4. v. i. p. 369.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect shrub, from twelve to fifteen feet high, with spreading light brown twigs, downy when young. *Leaves* elliptic oblong, not two inches long, tapering at each end with a sharp point, a dark green above, smooth, glaucous beneath, with a prominent mid-rib and reticulated veins, the margin unequally serrated, with glandular teeth, the *footstalks* rather slender, dilated at the base. *Stipules* half heart-shaped, or arrow-shaped, mostly small, glandulous on the edges and disk. *Catkins* on short stalks, bearing at the base several small silky recurved floral leaves. *Scales* oblong or lanceolate, silky and fringed, the upper part dark brown, almost black. *Capsule* nearly smooth, on a hairy stalk, ovate lanceolate, pubescent towards the point when young, smooth in maturity. *Style* about as long as the bifid spreading stigmas, pale, becoming brown.

Habitat.—Breadalbane Mountains, Scotland.—Mr. Borrer.

Shrub ; flowering in May.

This, Mr. Borrer remarks, is a much taller shrub than *S. Davalliana*, with leaves rather longer and more spreading, less shining, and of a duller green above, and whiter on the under side, and the flowers differ, as will be seen from the descriptions.

55. *S. Weigelia'na*, Willd. (Fig. 1525.) *Weigelian Willow*. Catkins becoming elevated on leafy stalks ; capsules downy, lanceolate, with an ovate base ; scales oblong, hairy ; style longer than the bifid stigmas ; leaves elliptical, rhomboidal, or almost round, with a short point, naked, glaucous beneath, the margin mostly obsoletely crenated ; stipules small, often wanting.



1693

Salix Davalliana.



1694

Salix tetraplo.



1695

Salix Weigeliana.



1696

Salix nitens.



1697

Salix Croweana.



1698

Salix bicolor.

English Botany, t. 2656.—Hooker, British Flora, ed. 4. vol. i. p. 369.—*S. Wulfeniana*.—English Flora, vol. iv. p. 176.—Salict. Wob. p. 95. t. 48. (exclusive the foreign synonyms)—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect *shrub*, about ten feet high, with short straggling branches, greenish brown, slightly downy when young. *Leaves* dark green, smooth and shining, glaucous beneath, with a prominent downy mid-rib and lateral veins, the margin more or less distinctly crenated, *footstalk* short, somewhat downy. *Stipules* small, half heart-shaped, often wanting. *Catkins* appearing before the leaves, at first sessile, becoming elevated on a short leafy stalk. *Scales* oblong lanceolate, hairy, the upper half dark brown. *Capsules* downy, becoming smooth, lanceolate, with an ovate base, elevated on a short hairy stalk. *Style* rather longer than the bifid *stigmas*.

Habitat.—Mountainous parts of England; Yorkshire, Westmoreland, &c.; and Breadalbane, Scotland.

Shrub; flowering in April and May.

56. *S. tenuifolia*, *Smith Fl. Br. (thin leaved Willow)*. "Leaves elliptical, acute, serrated, nearly glabrous, glaucous beneath; stipules small, or none; scales hairy; capsules ovate, glabrous, on a short smooth stalk."

Smith Fl. Brit. p. 1052.—English Botany, t. 2795, but not t. 2186, according to Mr. Borrer, which is *S. bicolor* of Ehrh, not Smith.—English Flora, vol. iv. p. 179.—Salict. Wob. p. 99. t. 50. (the true plant).—Hooker, British Flora, ed. 4. vol. i. p. 370.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

Habitat.—Above the Bridge of Kirkby, Lonsdale, 1788.

Shrub; flowering in May.

Of this very doubtful species Mr. Borrer observes that the best authenticated specimens he has seen scarcely differ from the preceding, but in having the germen and its stalk perfectly glabrous.

7. *S. nitens*, *And. MSS.* (Fig. 1526) *Shining leaved Willow*. Catkins on short leafy stalks; capsules lanceolate, downy; style longer than the stigmas; leaves ovate, or elliptical, acute, slightly crenated, nearly smooth, and with sunk veins above, smooth and glaucous beneath; stipules small, glandulous.

English Botany, t. 2655.—English Flora, vol. iv. p. 175.—Hooker, British Flora, ed. 4. vol. i. p. 370.—Salict. Wob. p. 87. t. 44.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect bushy *shrub*, about ten feet high, with dark brown branches, downy when young. *Leaves* about an inch and a half long, on a short reddish footstalk, ovate, or elliptic, acutely pointed, mostly rounded at the base, nearly smooth above, of a dark shining green, with sunk veins, the under side glaucous, quite smooth, with a prominent mid-rib and veins. *Stipules* small, half ovate, often wanting.

Catkins on short stalks, bearing several small lanceolate leaves. *Scales* oblong, obtuse, hairy, dark in the upper half, pale at the base. *Capsule* lanceolate, with an ovate base, downy, on a short hairy stalk. *Style* smooth, rather longer than the pale entire stigmas.

Habitat.—Scotland, *M. G. Anderson*. Teesdale, Yorkshire.

Shrub; flowering in April.

This species, it is observed by Mr. Borrer, is nearly allied to *S. Weigelianae*, and still more nearly to the following, *S. Croweana*.

58. *S. Croweana*, *Smith*. (Fig. 1527.) *Crowean Willow*. *Catkins* nearly sessile; capsules ovate lanceolate, downy; style long; stigmas ovate, obtuse; stamens, combined below; leaves elliptic, slightly serrated, nearly smooth, glaucous beneath; stipules half heart-shaped, rounded, crenated, often wanting.

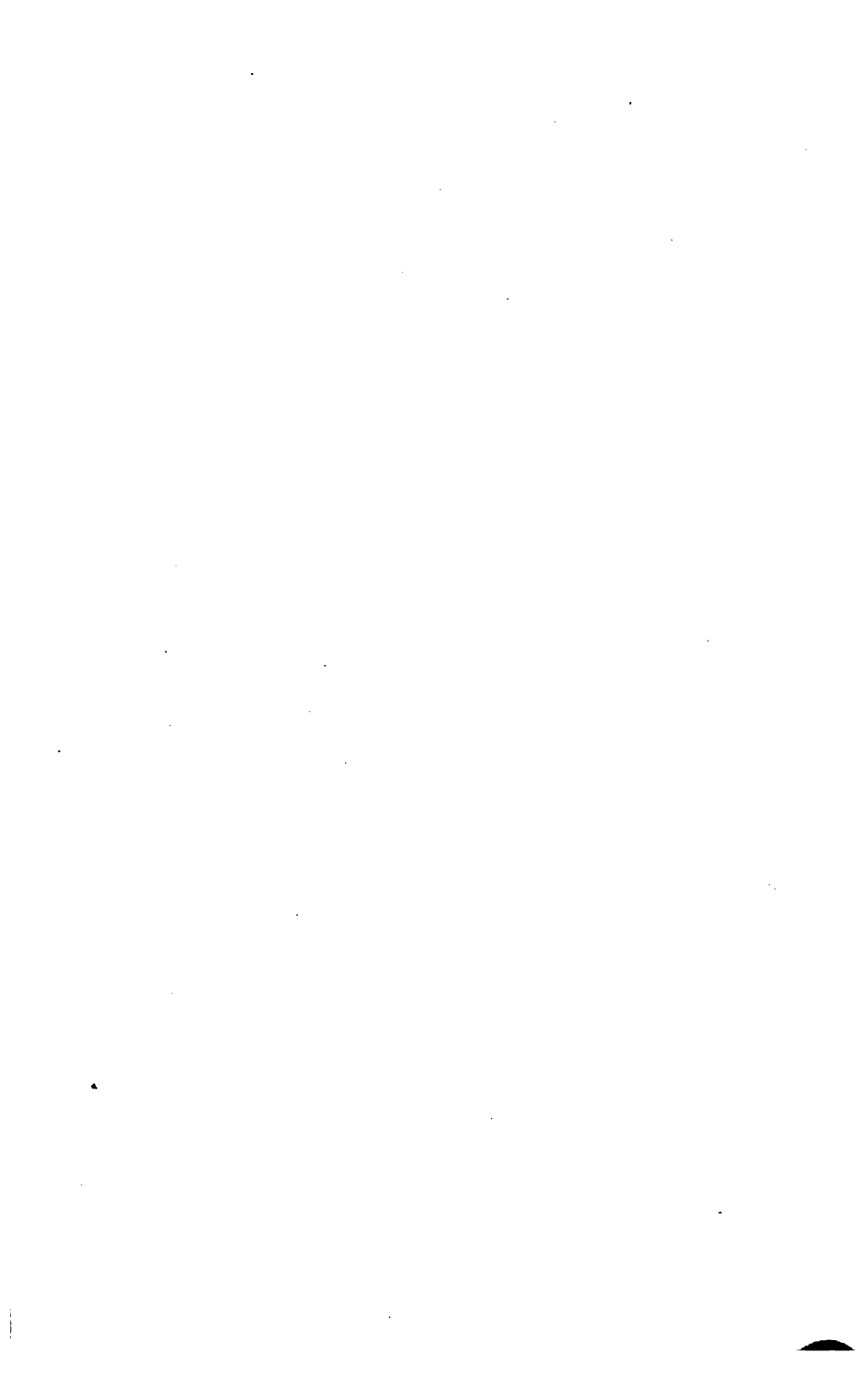
English Botany, t. 1146.—English Flora, vol 4. p. 192.—Hooker, British Flora, ed. 4. vol. i. p. 370.—Salict. Wob. p. 103. t. 52.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

A bushy shrub, about five feet high, with smooth spreading brownish yellow branches. *Leaves* elliptic lanceolate, dark green, and nearly smooth above, glaucous beneath, with a prominent mid-rib, the margin slightly serrated, curled or recurved at the point, the footstalk short, broad. *Stipules* small, half heart-shaped, obtuse, crenated, often wanting. *Catkins* on short stalks, mostly bearing two small floral leaves. *Scales* oblong, hairy, black in the upper half. *Stamens* with the filaments combined a greater or less height from the base. *Capsules* lanceolate, with an ovate base, downy, or smooth, on a short stalk. *Style* long. *Stigmas* entire, ovate, obtuse, becoming cloven, persistent.

Habitat.—Swampy meadows in Norfolk, and several parts of the North of England.

Shrub; flowering in May.

This species is remarkable in having the filaments more or less combined, a circumstance which Mr. Borrer, as stated in the British Flora, considers to be but an accidental monstrosity in that individual, from which all the plants that he has examined have originated. Mr. Forbes has described and figured in the "*Salicetum Wobornensis*;" the barren catkins changing into fertile ones, with the style and stigma perfect, as in the fertile florets. This remarkable metamorphose of parts has also been observed by Mr. Borrer in *S. oleifolia*; and Sir J. E. Smith, under *S. cinerea*, says, "a very curious specimen, gathered at Duckenfield, near Stockport, Cheshire, by Mr. Robert Gee, bears a monoecious catkin, the lower half of which consists of perfect germens, with their styles and stigmas, the upper of a few misshapen bodies, with apparently perfect stamens at the top." The change of stamens into style and stigma, and then bearing fruit, is extremely curious, and well worth the minutest investigation; the





1629

Salix phillyreifolia.



1630

Salix Dicksoniana.



1631

Salix vacoinifolia.



1632

Salix carinata.



1633

Salix prunifolia.



1634

Salix venulosa.

development of stamens into petals is common, and well understood; but the change altogether of formation and function, as in this instance, opens a wide and curious field of investigation.

59. *S. bicolor*, Ehrh. (Fig 1528.) *two coloured Willow*. Catkins on short leafy stalks, numerous; stamens with slightly bearded filaments; scale ovate, acute, downy; leaves elliptical, green and shining above, smooth and glaucous beneath, serrated, with oblique teeth; stipules small, crescent-shaped, serrated.

Hooker, British Flora, ed. 4. vol. i. p. 370.—*S. tenuifolia*.—English Botany, t. 2186. (*as to figure not Fl. Br.*)—*S. floribunda*.—Forbes in Salic. Wob. p. 107. t. 54.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

A bushy spreading *shrub*, becoming about ten feet high, with smooth yellowish branches, downy when young. *Leaves* elliptical, acute, glabrous, shining above, glaucous beneath, with a prominent mid-rib and lateral veins, the margin serrated, with small point like teeth, the mid-rib and footstalks smooth, yellow, the young leaves are somewhat downy and purplish. *Stipules* small, serrated, crescent-shaped, often wanting. *Catkins* numerous, yellow, appearing before the leaves, elevated on short leafy stalks. *Scales* ovate, or oblong, acute, fringed, with long hairs. *Stamens* yellow, with long slender filaments, somewhat bearded towards the base.

Habitat.—Highlands of Scotland; in Glenlyon, Banks of Ettrick.

Shrub; flowering in April, and again in July, (Forbes).

A shrub of considerable beauty when in flower, and its shoots, when the plant has been cut down, are long, tough, and flexible, useful for many purposes of tying, basket work, &c.

60. *S. phyllireifolia*, Borr. (Fig. 1529.) *Phillyrea-leaved Willow*. Catkins nearly sessile, becoming elevated on short leafy stalks; capsules lanceolate, smooth, with long cleft styles and bifid stigmas; scales oblong, hairy; leaves elliptic lanceolate, acute at each end, strongly serrated, smooth, glaucous beneath; stipules small, glandulous.

Borrer in English Botany Suppl. t. 2660.—Hooker, British Flora, ed. 4. vol. i. p. 371.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

An erect much branched *shrub*, about five feet high, with straight yellowish green twigs, minutely pubescent when young. *Leaves* about an inch long, elliptic lanceolate, acutely tapering at each end, a bright shining green above, with slightly sunk veins, a glaucous green beneath, becoming quite smooth, the mid-rib and veins prominent, the margin serrated, with somewhat waved glandular teeth, the footstalk slender, downy above. *Stipules* small, half ovate, glandulous, soon falling away, and often wanting. *Catkins* numerous, appearing before the leaves, at first sessile, becoming elevated on a short leafy downy stalk. *Scales* oblong, acute, or obtuse, brownish in the upper

half, fringed with silky hairs. *Capsule* lanceolate, smooth, on a smooth short stalk. *Style* rather long, bifid above. *Stigmas* spreading, bifid.

Habitat.—Highland Valleys of Scotland; Glen Tarfe, near Fort Augustus, Inverness-shire and Perthshire.

Shrub; flowering in April, and sometimes again at Midsummer.

Mr. Borrer says that this beautiful and apparently distinct Willow bears no slight resemblance in the size, figure, and serratures of the leaves to *Phillyrea latifolia*. In the arrangement of the genus it may stand between *S. bicolor* and *S. Dicksoniana*, in both of which the leaves are, for the most part, obsoletely serrated, and of a figure approaching to obovate, with a point. *S. Dicksoniana* is, moreover, of more humble stature, and has both the germen and its stalk densely silky.

61 *S. Dicksoniana*, Smith. (Fig. 1530.) *Broad leaved Mountain Willow*. Catkins on short leafy stalks; capsules ovate, stalked, silky; style very short; stigmas ovate, obtuse; scales oblong, purple; leaves elliptical, acute, slightly toothed, smooth, glaucous beneath; stipules very minute; branches quite smooth.

English Botany, t. 1390.—English Flora, vol. iv. p. 196.—Hooker, British Flora, ed. 4 vol. i. p. 371.—Salic. Wob. p. 109. t. 55. f. 2.—*S. arbuscula*, var.—Lindley, Synopsis, p. 235.

A small erect *shrub*, about a foot high, with smooth green branches, becoming brown. *Leaves* about an inch long, elliptic, acute, flat, scarcely serrated, a bright smooth green and even above, glaucous and finely veined beneath, the *footstalk* short, thick. *Stipules* half ovate, very minute, often wanting. *Catkins* appearing before the leaves, nearly sessile, with two or three small leaves at the base. *Scales* oblong, obtuse, or notched, brown or purplish, clothed and fringed with long silky hairs. *Capsule* ovate, downy, on a short stalk. *Style* short. *Stigmas* ovate, obtuse, thick, and yellow.

Habitat.—Highlands of Scotland.—*Mr. Dickson*.

Shrub; flowering in April.

This is a very doubtful species, and is regarded as such both by Sir W. J. Hooker and Mr. Forbes; but Mr. Borrer still seems to consider it as a distinct species. We, however, regard its characters, as good as those of many other plants which are considered as species, and though we have followed Mr. Borrer and Sir W. J. Hooker in our arrangement, still it does appear to us quite as reasonable to apply the same rules of distinction in species to this tribe of plants as to the others, and if reduced by their rules, the species must be arranged, as will be seen in our arrangement of the whole Flora, according to the natural orders, and as given by Koch and others, by which system the whole of the British plants are reduced from their present number to thirty.

Group 16. *Vaccinifolia*, Borr. *Small, procumbent, or rarely erect shrubs, with leaves bearing a considerable resemblance to those of a Vaccinium, opaque, glaucous beneath. Germens downy, sessile.*

62. *S. vaccinifolia*, Walk. Ess. (Fig. 1531.) *Bilberry-leaved Willow.* Catkins on short leafy stalks; capsules ovate, conical, downy, sessile; style cleft; stigmas bifid; leaves lanceolate, ovate, smooth and even above, glaucous and silky beneath; stems decumbent.

English Botany, t. 2341.—English Flora, vol. iv. p. 194.—Hooker, British Flora, ed. 4. vol. i. p. 371.—Salict. Wob. p. 118. t. 57.—*S. prunifolia*, var.—Lindley, Synopsis, p. 237.

A low shrub, with decumbent or trailing branches, slender, brown, silky when young. *Leaves* lanceolate ovate, green, smooth and even above, glaucous, and clothed with very fine silky hairs beneath, the margin finely serrated, the footstalk short, silky. *Stipules* very minute, or wanting. *Catkins* on short silky leafy stalks. *Scales* ovate, obtuse, or rather acute, very silky, and fringed, brown or purplish in the upper half. *Capsules* sessile, very silky, ovate, conical, with a short bifid style and cleft spreading stigmas.

Habitat.—Highland Mountains of Scotland; not unfrequent.

Shrub; flowering in April.

A pretty little shrub, nearly allied to the three following, and probably all form but varieties of a single species.

63. *S. carinata*, Smith. (Fig. 1532.) *Folded-leaved Willow.* Catkins on short leafy stalks; capsules ovate, conical, downy, sessile; style short; stigmas emarginate; leaves ovate, serrated, glabrous, glaucous beneath, and frequently folded, so as to form a keel; stem erect, with spreading branches.

English Botany, t. 1363.—English Flora, vol. iv. p. 197.—Hooker, British Flora, ed. 4. vol. i. p. 372.—Salict. Wob. p. 117. t. 59.—*S. prunifolia*, var.—Lindley, Synopsis, p. 237.

An erect shrub, about two feet high, with straight nearly smooth brownish green branches. *Leaves* ovate lanceolate, more than an inch long, dark green, and numerous serrated, with minute teeth, glaucous beneath, smooth on both sides, often recurved, and folded, so as to form a keeled back with the mid-rib, of a rigid texture, the footstalks short, thick. *Stipules* very minute, mostly wanting. *Catkins* on short leafy stalks. *Scales* ovate, obtuse, silky. *Capsules* ovate, conical, very downy, sessile. *Style* short. *Stigmas* ovate, spreading, entire, or notched, thick.

Habitat.—Highlands of Scotland.

Shrub; flowering in April and June.

64. *S. prunifolia*, Smith. (Fig. 1533.) *Plum-leaved Willow.* Catkins on short leafy stalks; capsules ovate, conical, silky, sessile; style short, stigmas emarginate; leaves ovate, serrated, smooth, more or less veiny, glaucous beneath; stem mostly erect, with lax branches.

English Botany, t. 1361.—English Flora, vol. 4. p. 193.—Hooker, British Flora, ed. 4. vol. i. p. 372.—Salict. Wob. p. 111. t. 37.—Lindley, Synopsis, p. 237.

A bushy *shrub*, about three feet high, with erect or ascending branches, greenish brown when young, and downy. *Leaves* ovate, about an inch long, finely serrated, smooth, of a deep shining green above, glaucous and veiny beneath, and scattered over with a few close silky hairs. *Stipules* ovate, minute, notched, often wanting, the footstalks short, stout, smooth or downy. *Catkins* appearing before the leaves, erect, or short leafy stalks. *Scales* rounded, or broadly ovate, brown, fringed and silky. *Capsules* ovate, conical, sessile, clothed with silky hairs. *Style* short. *Stigmas* ovate, spreading, cleft.

Habitat.—Highland Mountains of Scotland.

Shrub; flowering in April, and also in June.

65. *S. venulo'sa*, Smith. (Fig. 1534.) *Veiny-leaved Willow*. Catkins on short leafy stalks; capsules ovate, conical, silky; style short; stigmas ovate, notched; leaves ovate, serrated, glabrous, reticulated, with prominent veins above, somewhat glaucous beneath; stem erect, much branched.

English Botany, t. 1362.—English Flora, vol. iv. p. 195.—Hooker, British Flora, ed. 4. vol. i. p. 372.—Salict. Wob. p. 115. t. 58.—*S. prunifolia*, var.—Lindley, Synopsis, p. 237.

An erect *shrub*, about three feet high, numerously branched, smooth. *Leaves* ovate, a dark smooth green above, with prominent netted veins, a glaucous green, and somewhat silky beneath, the footstalk short, stout. *Stipules* ovate, minute, notched, often wanting. *Catkins* erect, oblong, on short leafy stalks. *Scales* ovate, brownish, silky. *Capsules* ovate, conical, silky, sessile. *Style* short, stigmas spreading, entire, or notched.

Habitat.—Highlands of Scotland.

Shrub; flowering in April, and also in June.

Group 17. *Myrsinites*, Borr. *Small bushy plants; with glossy, rigid, small, oval, or broadly elliptical serrated leaves, and downy germens.*

66. *S. myrsini'tes*, Linn. (Fig. 1535.) *Green Whorl-leaved Willow*. Catkins on long leafy stalks, loosely flowered; capsules ovate lanceolate, loosely silky; style long; stigmas linear, bifid; leaves elliptical, lanceolate, more or less waved and serrated, shining, with prominent veins, becoming quite smooth.

English Botany, t. 1360.—English Flora, vol. iv. p. 195.—Hooker, British Flora, ed. 4. vol. i. p. 372.—Salict. Wob. p. 119. t. 60.—Lindley, Synopsis, p. 237.

β. Leaves smaller, narrower.

Hooker, British Flora, ed. 4. vol. i. p. 372.



1535

Salix myrsinites.



1536

Salix procumbens.



1537

Salix herbacea.



1538

Salix hastata.



1539

Salix lanata.

An erect bushy *shrub*, about two feet high, with numerous short purplish leafy branches, hairy when young. *Leaves* a thick rigid texture, veiny, of a greyish green on both sides, and quite smooth, or scattered over with a few hairs, elliptic ovate, sometimes almost orbicular, and in the variety obovate lanceolate, with a short acute point, the margin finely serrated, the *footstalk* short, stout. *Stipules* somewhat ovate, toothed, smooth, of variable size. *Catkins* loosely flowered, ovate, on a long stalk, naked above, leafy at the base. *Scales* ovate, notched, brown, downy. *Capsules* sessile, or on a short stalk, lanceolate, with an ovate base, downy. *Style* rather long, bifid, with linear cleft *stigmas*.

Habitat.—Highland Mountains of Scotland, rare; Craigalleach, Brae-Riach, Clove Mountains; β . Craigalleach.

Shrub; flowering in June.

This forms a low shrub, with a thick much branching stem, and its thick glossy green leaves frequently remain withered upon the branches until the following year, and the flowers appear when the plant is in full leaf. The whole plant becomes almost black in drying.

67. *S. procumbens*, Forbes. (Fig. 1536.) *Smooth leaved Alpine Willow* Catkins on long leafy stalks; capsules lanceolate, with an ovate base, nearly sessile, very silky; style very short, deeply cleft; stigmas short, bifid, obtuse; leaves oval (rarely acute), obscurely serrated, shining, quite glabrous.

Salic. Web. p. 121. t. 61.—English Botany Suppl. t. 2763.—Hooker, British Flora, ed. 4. vol. i. p. 473.—*S. laevis*.—Hooker, British Flora, ed. 2. p. 432.—*S. retusa*.—Withering, ed. 4. vol. ii. p. 49.—*S. Myrsinites*.—Lindley, Synopsis, p. 238.

A bushy *shrub*, about three feet high, with spreading procumbent branches, and stout brownish twigs, hairy when young. *Leaves* numerous, oval, or sometimes oblong, and occasionally cordate at the base, of a thin reddish texture, somewhat recurved, the margins regularly serrated, with glandular teeth, a smooth shining green, somewhat paler beneath, sometimes scattered over with silky hairs, especially beneath, *footstalk* very short, channeled, dilated. *Stipules* small, ovate, flat, serrated, with glandular teeth. *Catkins* erect, cylindrical, obtuse, about two inches long, on long hairy leafy stalks. *Scales* ovate, obtuse, black, densely silky. *Capsules* sessile, or on a very short stalk, lanceolate, tapering upwards with an ovate base, silky. *Style* short, mostly cleft almost to the base. *Stigmas* thick, bifid, spreading.

Habitat.—Highlands of Scotland; Glen Coe, Breadalbane Mountains, and Brae-Riach, one of the Cairngorum range.

Shrub; flowering in June.

This very beautiful species, it is observed by Sir W. J. Hooker, has been cultivated for years in the Edinburgh Botanical Gardens, where it retains all its characters.

Group 18. *Herbaea*, Borr. *A minute shrub, remarkable for its small few flowered catkins.*

68. *S. herbaea*, Linn. (Fig. 1537.) *Least Willow*. Catkins terminal, of few flowers; capsule lanceolate, smooth; style cleft; stigmas bifid; leaves orbicular, serrated, smooth and glossy, veiny, on a short stalk.

English Botany, t. 1907.—English Flora, vol. 4 p. 199.—Hooker, British Flora, ed. 4. vol. i. p. 373.—Salic. Wob. p. 123. t. 62.—Lindley, Synopsis, p. 238.

Stem slender, procumbent, branched, smooth, dark brown, with long branched fibrous roots, branches erect, about an inch long, slender, bearing one or two leaves, and terminating in a few flowered catkin. *Leaves* orbicular, or somewhat ovate, sometimes notched, a smooth shining green, reticulated with veins on both sides, the footstalk short, mostly reddish. *Stipules* wanting. *Catkins* lax, few flowered, the footstalk downy. *Scales* ovate, smooth, or nearly so, or fringed with long hairs. *Capsules* lanceolate, with an ovate base, nearly sessile. *Style* variable in length, mostly cleft at the top. *Stigmas* spreading, bifid.

Habitat.—High Mountains of England, Scotland, and Wales.

Shrub; flowering in June.

This interesting little plant is one of the least shrubs known, seldom exceeding in height above the surface of the soil one or two inches, though its prostrate stem may be much longer; indeed Dr. Graham says that plants growing in the Botanic Garden of Edinburgh, have acquired a prostrate woody stem, two to three feet long, and nearly as thick as the little finger. This is, perhaps, one of the best examples we could have of the difference there is produced in the Willow, by being cultivated, for it is never found in its wild native mountains more than a few inches long, and thicker than pack thread; and we think that the same changes may be produced by other species grown in plantations, &c., and then described as species. This is the least of the Willows, if not the least known shrub; so diminutive is it that many of these plants, when full grown, fruit, leaves, stem, and roots, altogether do not weigh more than from ten to twenty grains each. It grows in the most elevated situation of any shrub in this country, and we believe also in Switzerland.

Group 19. *Hastata*, Borr. *Low shrubs, with very broad leaves, and exceedingly shaggy and silky catkins.*

69. *S. hastata*, Linn. (Fig. 1538.) *Apple-leaved Willow*. Catkins on leafy stalks; capsules subulate, on short stalks; style long; stigmas bifid; scales ovate, very shaggy, with long silky hairs; leaves broadly ovate, elliptical, waved, thin, crackling, glabrous, glaucous beneath; stipules large, half heart-shaped, serrated.

Hooker, British Flora, ed. 4. vol. i. p. 373.—Lindley, Synopsis, p.

285.—*Salict. Wob. p. 69. t. 35.*—*S. malvifolia*, Sm.—English Botany, t. 1617.—English Flora, vol. iv. p. 180.—*Salict. Wob. p. 71. t. 36.*

A spreading *shrub*, about five feet high, with crooked spreading branches, having almost black bark, downy when young. *Leaves* most crowded at the end of the branches, numerous, of a thin texture, crackling like an evergreen, of a broad elliptic oblong form, with an acuminate point, and contracted towards the base, a bright green above, glaucous beneath, with a prominent mid-rib and netted veins, the margin somewhat waved, and copiously toothed, the footstalks rather short, thick, spreading at the base, mostly smooth. *Stipules* large, half heart-shaped, waved, and serrated on the margin, smooth, glaucous at the back. *Catkins* erect, oblong, densely hoary, on lateral leafy branches. *Scales* obovate, fringed with copious long silky hairs. *Capsule* awl-shaped, with an ovate base, on a short stalk, smooth. *Style* rather long, cleft at the top. *Stigmas* spreading, bifid, or undivided.

Habitat.—Scotland. Sands of Barrie, near Dundee. Norfolk ?
Shrub; flowering in May.

70. *S. lanata*, Linn. (Fig. 1539.) *Woolly broad-leaved Willow.* Catkins terminal, sessile, very yellow, and hairy; capsules ovate, conical, smooth, on short stalks; scale oblong, very silky; style long; stigmas undivided; leaves broadly ovate, somewhat cordate, entire, shaggy, glaucous beneath; stipules ovate, toothed.

English Botany Suppl. t. 2624.—English Flora, vol. iv. p. 205.—Hooker, British Flora, ed. 4. vol. i. p. 374.—*Salict. Wob. p. 141. t. 71. f. 2.*—Lindley, Synopsis, p. 236.

A *shrub*, three to four feet high, with spreading tortuous branches, with a smooth brown shining bark. *Leaves* from two to three inches long, broadly ovate, obovate, and sometimes approaching lanceolate, the point mostly acute, and often cordate at the base, green, and more or less clothed with hairs above, glaucous, and often shaggy beneath, becoming more or less smooth, the margin entire, rarely waved, or crenated, *footstalks* short, thick, spreading at the base. *Stipules* rather large, ovate, entire, more or less acutely pointed, soon falling away. *Catkins* terminal and lateral, the barren ones numerous, about two inches long, with oblong purplish very silky scales. *Stamens* two, sometimes three, the *filaments* often more or less united, *fertile catkins* from two to four inches long, erect, cylindrical, on a short leafy stalk. *Scales* very silky. *Capsules* ovate, conical, on a short stalk, smooth. *Style* rather long, slender. *Stigmas* ovate, yellow, entire.

Habitat.—Scottish Mountains; rare. Glen Callater.—*Mr. G. Don.* Head of the Glen of Dole, two miles west of Acharne, the uppermost farm-house of Clove, Angusshire.

Shrub; flowering in May.

Sir J. E. Smith, quoting the remarks of Wahlenberg upon this plant, says that "this is the most beautiful Willow in Sweden, if not in the whole world. The splendid golden catkins at the ends of the young branches light up as it were the whole bush, and are accompanied by the young foliage, sparkling with gold and silver. It yields more honey than any other *Salix*, insomuch that the catkins are sweet in the mouth, and are much frequented by alpine bees. From the marginal glands of the stipules, and sometimes from those of the leaves, a gummy exudation proceeds, staining paper, in which the plant is dried, like *S. pentandra*."

ORDER II.

TRIAND'RIA. 3 STAMENS.

GENUS II. EMPE'TRUM.—LINN. *Crow-berry*.

Nat. Ord. EMPETRE'Æ. NUTT.

GEN. CHAR. *Flowers* with the perianth of numerous imbricated scales, the inner ones often regular, spreading, and petaloid. *Barren flowers* with three *stamens*, the *filaments* long. *Fertile flowers* with peltate *stigmas*, in numerous rays. *Fruit* a superior globose *berry*, with six to nine *seeds*.—Name from *em*, in; and *petros*, a stone; so called from its growing in stony places.

1. *E. nigrum*, Linn. (Fig. 1540.) *Black Crow-berry*, or *Crake-berry*. Procumbent leaves, oblong, linear; stigma with nine rays.

English Botany, t. 526.—English Flora, vol. iv. p. 283.—Hooker, British Flora, ed. 4. v. i. p. 375.—Lindley, Synopsis, p. 224.

A small procumbent *shrub*, much branched, slender, smooth, dark brown, partly ascending. *Leaves* numerous, crowded, imperfectly whorled, linear, oblong, obtuse, a dark shining green, the margins recurved, *footstalk* short, terminating in a pale mid-rib. *Flowers* sessile, in axillary clusters towards the top of the branches, small, purplish. *Stamens* purplish, with long *filaments*, and large two-celled *anthers*. *Fruit* a black round berry, about half the size of a currant, clustered, numerous, containing about eight erect triangular *seeds*.

Habitat.—Mountain heaths; abundant in the North.

Shrub; flowering in May.

The berries have somewhat the flavour of Elder berries, and form the chief food of moor game and other mountain birds. They are often eaten by the children of the Highlands of Scotland, but it is said they give them the head-ache. Gmelin says that in Siberia an acrid





1540

Empetrum nigrum.



1541

Ruscus aculeatus.



1542

Viscum album.



1543

Hippophae rhamnoides.



1544

Myrica Gale.



1545

Humulus Lupulus.

drink, resembling lemonade, is made from them; and the Kamtschadales not only eat them with their fish, and make them into puddings with lily bulbs, but use them also for dyeing their clothes a black colour; and it is stated by Gunner in his *Fl. Norweg.* that they make a part of the food of the Norwegian Laplanders, and that a sort of wine has been prepared from them for about six hundred years past in Iceland, as well as in Norway. Otter and sable skins are reported to be dyed black with crow-berries. The slender stems and branches are very strong and tough; and Mr. Neile says that he saw at Deerness, in Orkney, very strong ropes, well calculated for different purposes in rural economy, made from the shoots of the crow-berry.

GENUS III. RUSCUS.—LINN. *Butcher's-broom.*

Nat. Ord. SMILACÆE. Br.

GEN. CHAR. *Perianth* single, of six pieces, on the front of the leaves, generally expanding. *Barren flowers* with the *filaments* combined at the base. *Anthers* three to six. *Fertile flowers* with a single *style* and *stigma*. *Nectary* tubular. *Fruit* a globose three celled *berry*, each cell two-seeded.—Name, “anciently *Bruscus*, from *Beus-kelen*; in Celtic, Box Holly.”—*Hooker.*

1. *R. aculeatus*, Linn. (Fig. 1541.) *Common Butcher's-broom.* Stem rigid, branched; leaves ovate, acuminate, very rigid and pungent, bearing a solitary flower on their surface, with minute scarios scales at the base.

English Botany, t. 560.—English Flora, vol. iv. p. 234.—Hooker, British Flora, ed. 4. vol. i. p. 375.—Lindley, Synopsis, p. 270.

Root of numerous long fleshy branched fibres. *Stem* round, green, furrowed, much branched, about two feet high. *Leaves* numerous, scattered, of a firm rigid texture, dark green, quite smooth, ovate, acuminate, with rigid pungent point, numerous ribbed, keeled at the back, on a short footstalk, with a pale membranous lanceolate stipule at the base. *Flower* solitary, small, pale green or white, arising from the disk of the leaf, sessile, with several small membranous scales at the base, one of them rigid, spiny. *Fruit* a globose berry, of a fine scarlet colour, three celled, six seeded, but seldom perfecting more than one, the size of a small cherry.

Habitat.—Bushy and heathy places, especially in a sandy soil; abundant in the Southern parts of England; rare in Scotland. Bothwell Wood, Skelton Wood, near Ayr.

Shrub; flowering in March.

After the berry is formed the leaf turns round, so that the under surface becomes the upper, by which means the berry is protected

from mischief, and the rain is prevented from injuring it by this simple but admirable contrivance; for if the berry in the bosom of the leaf remained upwards, moisture would be lodged about it, and speedily decay it, but by its being turned with the keel upwards all danger from this is removed. The green branches tied together, and formed into brooms, were formerly much used by butchers for cleaning their blocks, whence the common English name of Butcher's-broom. The young tender shoots have been used by poor people as a vegetable, like those of asparagus. Its evergreen branches, with its scarlet berries, form a beautiful winter decoration, together with the dried stalks and capsules of the Peony and Iris. It is a useful evergreen shrub to plant under the drip of trees, and in sandy or stony places, and is very ornamental when in fruit.

ORDER III.

TETRA'NDRIA. 4 STAMENS.

GENUS IV. VISCUM.—LINN. *Misseltoe*.

Nat. Ord. LORAN'THEÆ. JUSS.

GEN. CHAR. *Calyx* obsolete. *Barren flowers* with four ovate fleshy petals, united at the base, each bearing about its middle a sessile anther. *Fertile flowers* with four erect small ovate petals. *Stigma* sessile. *Fruit* an inferior one-seeded berry.—Name, *viscus*, clammy; on account of the sticky nature of the berries; *ἔξος*, of the Greeks.

1. *V. album*, Linn. (Fig. 1542.) *Common Misseltoe*. Stems dichotomous, with numerous round branches; leaves obovate lanceolate, obtuse; flowers about five, sub-globose in the axis of the upper leaves.

English Botany, t. 1470.—English Flora, vol. iv. p. 237.—Hooker, British Flora, ed. 4. vol. i. p. 375.—Lindley, Synopsis, p. 133.

Root woody, thick, deeply embedded in the tree upon which it is growing. *Stem* very much divided into numerous short round yellowish green branches, in a forked manner. *Leaves* in pairs, hard, leathery, thick, from one to two inches long, flat, smooth, scarcely ribbed, obovate, or oblong lanceolate, obtuse. *Flowers* in the axis of the leaves, in a globose head, about five or six, crowded, yellowish. *Berries* globose, white, pellucid, glutinous, with a sweetish taste, one cell, single seeded.

Habitat.—Parasitic upon the apple tree, hawthorn, &c.; common in the South of England; Meiklcour, Scotland.

Shrub; flowering in May.

The Mistletoe, though found mostly growing upon Apple trees, is not very unfrequent upon the Oak, the Hawthorn, Lime, Maple, Poplar, Ash, &c. The Mistletoe is the only true parasitical plant indigenous to Britain, since it has not at any period of its growth any connection with the ground, as the *Orabanchies* and *Cuscutas* have. The germination of the Mistletoe and its allied genus, *Loranthus*, is a subject of considerable physiological interest. The berries are a favourite food of thrushes, blackbirds, &c. ; and as the hard cased seed which they contain passes through the intestines of the birds uninjured, they are lodged, after being stimulated to germination in their passage, in the situation upon the branches of trees most fitted for their growth ; and as from the berries bird lime is made, the doggrel rhyme is true, that

" The thrush when he pollutes the bough,
Sows for himself the seeds of woe."

The seeds being deposited, they, during germination, send out the radicle, which tends towards the centre of the branch in whatever part they may happen to be fixed. This law, which seems to be constant with these parasites, is contrary to that of all other seeds of plants, which put out their radicle, and tend towards the centre of the earth, and not towards the centre of the object upon which they grow. These parasitical plants are not difficult to propagate, by making a slit in the bark of a tree, inserting the seed within it, and then tying it in its place by a shred of mat to protect it from birds.

The Mistletoe is always associated with our ideas in the remembrance of Christmas, and its festivities and the custom of decking churches and houses with evergreens at that period of the year, a custom which has been in existence ever since the establishment of Christianity amongst us, and appears to have been derived from a similar practice of the Pagans. "Trimming of temples," says Polydore Virgil, "with hangyngs, flowres, boughes, and garlandes, was taken of the heathen people, which decked their idols and houses with such array." The Goths and the Celts regarded the Mistletoe with most respectful veneration, and the Druids were famed for the religious regard with which they considered the Mistletoe of the Oak, and the virtues which they attributed to it, when found growing, as it now but rarely is, on that tree. At certain seasons of the year, and especially at Yule Tide or Christmas, they were accustomed to gather it with great solemnity, and to sacrifice two white bullocks that had never been yoked. It was cut from the tree with a golden bill or knife, by a priest, habited in a white vestment, and was received in a woollen cloth ; many orations were then said over it, and after the ceremony the sacred plant was preserved with religious care. According to the account of the Rev. Mr. Shaw, there is still a practice amongst the inhabitants of Elgin and Moray Shires, Scotland, to cut withes of the Mistletoe or Ivy at the full moon in March,

and make them into circles, to keep all the year, pretending with them to cure "hectics and other troubles." Poetically identified with the Misseltoe is the golden bough of Virgil, which was the passport of Æneas to the infernal regions; he was guided to the tree on which it grew in the "thick woods" by two doves, his mother's birds—

"Hopping and flying thus, they led him on
To the slow lake; whose baleful stench to shun,
They wing'd their flight aloft; then, stooping low,
Perch'd on the double tree that bears the golden bough,
Through the green leaves the glittering shadows glow;
As, on the sacred Oak, the wintry Misseltoe,
Where the proud mother views her precious brood,
And happier branches which she never sow'd,
Such was the glittering, such the ruddy rind,
And dancing leaves, that wanton'd in the wind.
He seiz'd the shining bough with griping hold,
And rent away with ease, the ling'ring gold;
Then to the Sibyl's palace bore the prize."

Virgil Æneis, vi. 294.

The Misseltoe is slightly astringent, and has been used for the cure of epilepsy, and some diseases of females; but its medicinal powers are now as lightly regarded as its moral influence; and it is now only esteemed for the licence which it gives to youths on Christmas Eve, to salute the maiden, who may be caught under it, as long as a berry remains upon its branches.

GENUS V. HIPPOPHÆ.—LINN. *Sallow-thorn.*

Nat. Ord. ELEAGNÆE. BROWN.

GEN. CHAR. *Barren flowers* collected into a small kind of catkin, each scale bearing a flower. *Perianth* tubular, bifid at the apex, closed. *Anthers* linear, sessile, two celled. *Fertile flowers* solitary, perianth single, tubular, cloven at the summit. *Style* short. *Stigma* subulate. *Fruit* a one seeded nut, surrounded by the coloured succulent calyx.—Name *ῥαμνος*, a horse; and *φω*, to brighten; probably not originally applied to this plant.

1. *H. rhamnoides*, Linn. (Fig. 154.3) *Common Sallow-thorn*, or *Sea Buck-thorn*. Leaves linear lanceolate.

English Botany, t. 426.—English Flora, vol. 4 p. 237.—Hooker, British Flora, ed. 4. vol. i. p. 375.—Lindley, Synopsis, p. 208.

A bushy *shrub*, four to five feet high, with straight rigid branches, terminating in a sharp pointed thorn. *Leaves* numerous, linear lanceolate, scattered on a short footstalk, dark green, and dotted above, white and silvery beneath. *Flowers* very small, pale green in the axis of the young leaves. *Berries* globose-elliptic, on a short stalk, orange-coloured, smooth, with a pleasant acid flavour.

Habitat.—Sand hills and cliffs upon the South and South-east coast of England.

Shrub; flowering in May.

The acid berries are used as a condiment in the South of France, as well as Sweden, and are said to be eaten by the Tartars, and that the fishermen in the Gulph of Bothnia prepare a rob from them, and use it for its flavour as a sauce to fish. The berries, as well as all other parts of the plant, contain a yellow colouring matter, which may be used as a dye.

GENUS VI. MYRICA.—LINN. *Gale*.

Nat. Ord. MYRICACE. RICH.

GEN. CHAR. *Catkins* with conical scales. *Perianth* wanting.

Barren flowers with from four to six *stamens*, the *anthers* four valved. *Fertile flowers* with two *styles*, and a single ovary.

Fruit a one celled single seeded *drupe*, the seed without albumen.

Name *μυrica*, in Greek; synonymous with the *Tamarix*.

1. *M. Gale*, Linn. (Fig. 1244.) *Sweet Gale*, or *Dutch Myrtle*. Leaves lanceolate, broader upwards and serrated; stem shrubby.

English Botany, t. 562.—English Flora, vol. iv. p. 239.—Hooker, British Flora, ed. 4 vol. i. p. 375.—Lindley, Synopsis, p. 242.

An erect much branched bushy *shrub*, with dark smooth bark, downy when young, bearing numerous alternate *leaves*, of a lanceolate or obovate lanceolate shape, somewhat serrated towards the point, a smooth dark green above, paler beneath, and somewhat hairy, especially on the prominent mid-rib and short footstalk, deciduous. *Catkins* numerous, sessile in the axis of the upper leaves, remaining during the winter, and part of the following summer, ovate oblong, crowded. *Scales* ovate, acute, concave, a shining red, studded with numerous small glands, often hairy at the tip. *Berries* small, ovate, compressed, studded over with resinous dots, having a very pleasant fragrant odour.

Habitat.—Bogs and moory ground; abundant, especially in Scotland.

Shrub; flowering in May.

The leaves, as well as the catkins, exhale a fine aromatic fragrance, and are at the same time bitter, on which account they have been used as a substitute for hops by the poor people of Sweden, and in some parts of the Highlands of Scotland. The catkins, when boiled in water, impart to it a kind of wax, which, if collected and dried, may be used for making candles in the same manner as that obtained from the *M. cerifera*, or *Candle-berry Myrtle*, a native of North America. From the tanning matter which the plant contains, it is

used to tan calf skins, and it also is used for dyeing yellow. A decoction of the leaves is used as a vermifuge in the Highlands of Scotland, and the branches laid under and upon these beds is said to be so objectionable to vermin that it kept them away. In Isla and Jura the inhabitants use it for garnishing their dishes, and lay the leaves amongst their linen for the purpose of communicating a strong scent, and to drive away moths, &c. It is eaten by horses, but refused by cows and goats.

ORDER IV.

PENTANDRIA. 5 STAMENS.

GENUS VII. HUMULUS.—LINN. *Hop*.

Nat. Ord. URICÆ. JUSS.

GEN. CHAR. *Barren flowers* in loose racemes. *Perianth* single, five partite. *Stamens* five, the *anthers* opening with two pores at the extremity. *Fertile flowers* oblong *catkins* or *cones*, its scales membranous, large, concave, persistent, having a single flower at the axis of each. *Styles* two. *Fruit* single seeded. *Embryo* spiral. —Name *humus*, rich soil or mould, in which the plant best flourishes.

1. *H. Lupulus*, Linn. (Fig. 1545) *Common Hop*.

English Botany, t. 427.—English Flora, vol. iv. p. 240.—Hooker, British Flora, ed. 4. vol. i. p. 276.—Lindley, Synopsis, p. 219.

Root branched, creeping. *Stem* herbaceous, angular, twining, climbing to the height of several feet, branched, leafy, roughish. *Leaves* opposite, large, three to five lobed, coarsely serrated, heart-shaped at the base, rough, with minute points, dark green above, paler beneath, with prominent branched veins. *Footstalks* long, stout, channeled, united at the base, with lanceolate membranous *stipules*, pale, reflexed. *Flowers* pale, yellowish green, the *barren* ones in reflexed axillary panicles, the *perianth* in five oblong lanceolate spreading segments, *fertile flowers* in oblong strobules, on slender axillary footstalks, its scale ovate, concave, acutely pointed, veiny.

Habitat.—Thickets and hedges in various places.

Perennial; flowering in July.

The fruit of the *Hop* is well known from being extensively used in the manufacture of beer and ale. The cultivation of the Hop plant was introduced into the South of England from Flanders, in 1524, and the fruit began to be used in the brewing of beer towards the end of the reign of Henry VIII. But the favour with which Hops are now

esteemed is as great as was the prejudice against their introduction, for Walter Blith, in his "Improver Improved," published in 1649 and 1653, says, "that it was not many years since the famous city of London petitioned the Parliament of England against two nuisances; and these were Newcastle coals, in regard to their stench, &c., and hops, in regard they would spoyle the taste of drink, and endanger the people." The female plant is alone cultivated for its fruit, and of these there are several varieties grown under the name of Flemish, Canterbury, Goldings, &c., which are more or less valuable according to the soil in which they are grown. The formation of Hop plantations involves a considerable outlay, from the necessity there is in having the ground deeply trenched and well prepared with manure, and fining the soil, and it is three years before the plants come to a state of profitable bearing. The cuttings are planted in rows about six feet apart, in circular clusters of about seven, and are supported upon poles about fourteen feet long.

The fruit is known to be ripe when it assumes a brownish colour, and of a firmer consistence; the plants are then cut down about three feet from the ground, and the Hops carefully picked from the leaves and stalks, and are immediately dried in kilns, heated with charcoal; if not, they are very liable to lose both in colour and flavour, by being together while containing moisture. After they are sufficiently dry, and become somewhat crisp, it is found that five pounds of the fresh Hops are diminished to about one. They are then closely packed in canvas bags, called *pockets*, each weighing about one and a quarter hundred-weight, and in this state are brought to market.

Of all the crops grown in England the Hop is the most liable to variation: in what is considered a good season an acre of ground will produce about twenty-hundred weight, but in a bad season often not more than two or three; and the quality of the Hop also varies considerably with the season: when they are of a fine bright yellow colour, and abound with an unctuous clammy powder, they are considered the best.

The Hop is very liable to diseases, as honey dew, mould, fire blast, and other blights, and it suffers considerably at different periods from the depredation of insects.

The Hop is chiefly used for the preservation of beer, and giving it a degree of aroma and bitterness. In medicine it is esteemed as a tonic, combined with a sedative principle, and has been found of great use in the form of extract or tincture in giving tone to the stomach, and allaying nausea and flatulency after taking food in some forms of debility, especially after the use of irritating aperients, &c. A pillow of hops is said to be useful in procuring sleep in mania or delirium in fevers, but it is seldom used. Administered in the form of extract, tincture, powder, or infusion, and used as a fomentation, it has been found to give relief in painful swellings and tumours:

it may be applied by flannels, wrung out of a decoction of the Hops, or what is better, by inclosing the vegetables in a flannel bag, and after boiling them a short time, press out the water, and apply the bag as hot as it can be borne.

The active principle of Hops is found to reside in a peculiar substance, called *lupulite*, which has the bitterness of the Hop, and when heated the same smell, and by distillation with water a volatile oil passes over, containing a portion of sulphur and acetate of ammonia.

ORDER V.

HEXAN'DRIA. 6 STAMENS.

GENUS VIII. TA'MUS.—LINN. *Black Bryony*.

Nat. Ord. Diosco'RIÆ. BROWN.

GEN. CHAR. *Perianth* six-partite, single. *Barren flowers*, perianth spreading. *Stamens* six. *Fertile flowers*, perianth superior, contracted at the neck. *Style* one. *Stigmas* three. *Berry* ovate, three celled, each cell two seeded.—Name supposed to be *Uva Taminia*, of Pliny, or *Black Bryony*.

1. *T. communis*, Linn. (Fig. 1546.) *Common Black Bryony*.
Leaves undivided, cordate, acuminate.

English Botany, t. 91.—English Flora, vol. 4. p. 241.—Hooker, British Flora, ed. 4. vol. i. p. 376.—Lindley, Synopsis, p. 271.

Roots large, fleshy, black externally, white within. *Stems* long, slender, twisting, and climbing up trees, &c., to a considerable height, without tendrils. *Leaves* alternate, a bright shining green, broadly heart-shaped at the base, with a long acuminate point, the *footstalk* long, slender, channeled, with a pair of slender *stipules* at the base. *Flowers* pale yellowish green. *Barren flowers* in long loose imperfectly whorled racemes, mostly in pairs from the axis of the leaves. The *fertile flowers* in short racemose clusters. *Berries* globoso-oblong, smooth, fleshy, shining, a bright orange red.

Habitat.—Hedges, thickets, woods, &c.; common.

Perennial; flowering in June.

The fleshy roots abound in feculent matter, combined with a bitter principle; but by heat and washing this is removed, and a nutritive fecula is left, which may be used as a food. The smaller tubers attached to the large one are much the most acrid, so much so, that beaten into a pulp, they have been used as a stimulant in external application. The tender young shoots of the plant have a mild agreeable flavour, and are sometimes used by the poor people as a spring vegetable, as asparagus, and by the Moor they are said to be boiled and eaten with oil and salt.

1646

Tamnus communis.



1647

Populus alba.



1648

Populus canescens.



1649

Populus tremula.



1650

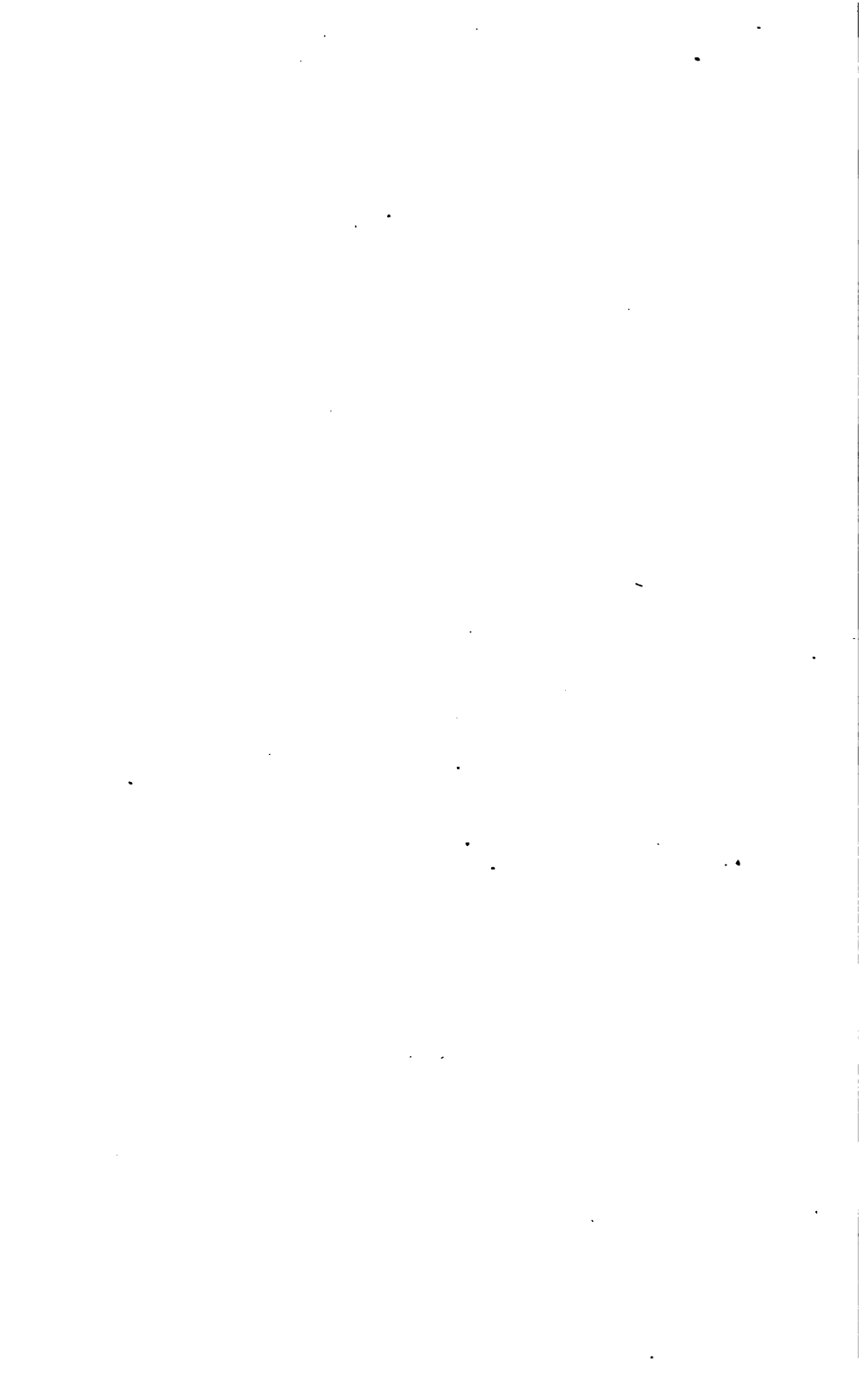
Populus nigra.



1651

Rhodiola rosea.





ORDER VI.

OCTANDRIA. 8 STAMENS.

GENUS IX. POPULUS.—LINN. *Poplar*.

Nat. Ord. SALICINÆ. RICH.

GEN. CHAR. *Flowers* in cylindrical *catkins*, the scales jagged at the end. *Barren flowers* with eight to twenty *stamens*, arising from an obliquely truncated *cup* at the base of the scales. *Fertile flowers* with the *perianth* turbinate. *Stigmas* four to eight. *Capsules* superior, imperfectly four celled by the rolling in of the edges of the valves. *Seeds* numerous, comose. *Radiols* superior. —Named *populus*, by its being commonly planted in places of amusement by the Romans, and hence became the tree of the people. The most striking gate and imposing entrance into Rome is called the Piazza del Popolo, from the circumstance of some famous Poplar trees having grown there.

1. *P. alb'a*, Linn. (Fig. 1547.) *Great White Poplar*, or *Abela*. Leaves roundish, heart-shaped, lobed, toothed, glabrous above, downy, and very white beneath, the terminal leaf five lobed; fertile catkins ovate, with brown fringed scales; stigmas four.

English Botany, t. 1618.—English Flora, vol. iv. p. 243.—Hooker, British Flora, ed. 4. vol. i. p. 376.—Lindley, Synopsis, p. 238.

Root widely extending, and putting up abundance of *suckers*. *Trunk* erect, from eighty to ninety feet high, with a smoothish bark, and horizontal spreading branches, white and cottony when young. *Leaves* roundish, heart-shaped at the base, angular, and from three to five lobed, variously and unequally toothed with blunt teeth, dark green above, very white and cottony beneath, *footstalks* rather long and slender, with a pair of lanceolate *stipules* at the base, often wanting. *Barren catkins* about three inches long, cylindrical, pendulous, with brown toothed and fringed scales. *Cup* on a short stalk, obliquely cut at the mouth, the *stamens* usually eight, with short thick purple *anthers*. *Fertile catkins* at first ovate, becoming elongated, having rather smaller scales than the barren catkins. *Germen* ovate, green, smooth, embraced in the lower half by the perianth. *Stigmas* linear, spreading, paleish green, downy.

Habitat.—Moist and Mountain Woods.

Tree; flowering in April.

2. *P. canescens*, Smith. (Fig. 1548.) *Grey Poplar*. Leaves roundish ovate, angularly toothed, beneath as well as the branches greyish white, with downiness; fertile catkins cylindrical, with brown ciliated scales; stigmas eight.

English Botany, t. 1619.—English Flora, vol. iv. p. 243.—Hooker, British Flora, ed. 4. vol. i. p. 376.—Lindley, Synopsis, p. 238.

Root creeping as widely and putting up suckers as abundantly as the last. *Trunk* erect, from eighty to a hundred feet high, with smooth silvery grey bark, its branches spreading, though less so than *P. alba*. *Leaves* roundish, rather than ovate, not distinctly heart-shaped at the base, unequally and obtusely toothed, smooth, dark green above, white and downy beneath, but less so than those of *P. alba*, and sometimes smooth, the *footstalks* rather long, compressed, with a pair of *stipules* at the base, though often wanting. *Catkins* longer, pendulous, with more regularly pectinated scales: these, together with the *stigmas*, being double the number of *P. alba*, are the most obvious marks of distinction between these two nearly allied species.

Habitat.—Wet turfy meadows and dry heaths; frequent in Norfolk. Tree; flowering in March.

The properties and uses to which these two species are applied are so similar that we give them both at the same time, indeed they have by some botanists been considered varieties of the same species.

The trees are of rapid growth, and more so when planted upon the banks of streams; but like all other trees of rapid growth they are of but short duration, attaining maturity in wet places in about fifty years, while in dry ones they last from ten to twenty years more: they seldom exceed two hundred years old under the most favourable circumstances. In woods they rapidly propagate themselves by suckers, which soon form young trees, useful for poles, fuel, &c.

The Poplar, as we have already mentioned, was well known to the Romans, indeed Pliny mentions three species, and states that they were planted as a prop for vines; and at the present time in many parts of Italy it is almost the only tree planted by the bank sides and borders of fields in moist soil, for the support of the vines, while the upper branches cut every year are used as fuel, especially for heating ovens. The ancients supposed the leaves possessed many medicinal properties, and applied them for the cure of various diseases; and it was the opinion of some of the old writers that amber was the produce of the Poplars planted on the banks of the River Po, an idea arising from a poetical fable that those trees were originally the sisters of Phæton, metamorphosed by Jupiter, for weeping over the body of their brother, who had been consumed by celestial fire, for his rashness in driving his flying horses out of their usual track, and that their tears constantly dropping from the leaves of the Poplars congealed into the fragrant amber (See also *Alder glutinosa*). We are also told that the white Poplar was specially dedicated to Hercules, because he destroyed Cacus in a cavern adjoining Mount Aventinus, which was covered with these trees. Cacus was a famous robber, son of Vulcan and

Medusa, represented as a three-headed monster, and as vomiting flames. Cacus robbed Hercules of some of his cows, and consequently was attacked by Hercules for his depredation, who squeezed and strangled him in his arms, though vomiting fire and smoke; and in the moment of his triumph Hercules was crowned with a branch of white Poplar, and when that hero accomplished his twelfth labour, and returned from the infernal regions, he was crowned with the wreath of white Poplar. From these and similar circumstances we learn that those persons who sacrificed to the different gods wore garlands upon their heads, composed of different leaves of trees, which were accounted sacred to the god to whom they paid their devotions. Thus those who sacrificed to Hercules wore a crown of the Poplar leaves, and those to Apollo a crown of Laurel, &c., which is thus related by Virgil, Pastoral viii. 84.

"The Poplar is by great Alcides worn;
 The brows of Phœbus his own bays adorn;
 The branching Vine the jolly Bacchus loves;
 The Cyprian queen delights in Myrtle groves;
 With Hazel Phyllis crowns her flowing hair;
 And, while she loves that common wreath to wear,
 Nor bays, nor Myrtle boughs, with Hazel shall compare."

The wood of the Poplar is light, soft, and white, and is used by cabinet and toy makers, and turners use it for making wooden vessels, where lightness and durability are required: by the ancients it was esteemed for making bucklers, on account of its softness and lightness, for which purpose it is well adapted, since it does not split from blows, or crack from being pierced, as the harder woods. It is an excellent material for making room floors, and it is not easy to ignite, and when burning does not blaze as the resinous woods, such as the Deals or Firs do: it is equally valuable for other purposes of building.

As an ornamental tree it is not esteemed in pleasure grounds of limited extent, on account of its large size and disproportion to most other trees; but for the formation of groves and planting on road sides, especially in a damp soil, it is one of the best, and in many parts of the Continent it is planted for miles in extent. Poplars are trees which soon decay, if from any accident their branches are broken and rain is admitted. The leaves are the food of numerous insects, and very liable to be infested with several species of small fungi, as well as the trunk of the tree with the larger ones.

8. *P. tremula*, Linn. (Fig. 1549) *Aspen* or *trembling leaved Poplar*. Leaves nearly orbicular, broadly toothed, smooth on both sides; footstalks compressed; scales deeply cut and hairy; stigmas four.

English Botany, t. 1909.—English Flora, vol. iv. p. 244.—Hooker, British Flora, ed. 4. vol. i. p. 376.—Lindley, Synopsis, p. 238.

A tall erect *tree*, with a round clean trunk, the bark smooth, becoming grey, and cracked with age, its branches spreading, becoming pendulous, the young branches slender, reddish, smooth or hairy. *Leaves* roundish, with a short point, and serrated, with broad often unequal teeth, a dark smooth, green above, somewhat paler beneath, and downy when young, the *footstalks* vertically compressed. *Catkins* long, lax, pendulous, the *barren* ones with deep cut hairy brown scales, and about eight *stamens*, the *fertile* ones with the scales cut in a palmate manner, and usually more hairy. *Germen* roundish, enveloped at the base with the perianth. *Stigmas* four, bright crimson.

Habitat.—Moist woods; frequent in Scotland, growing even at an elevation of fifteen hundred feet above the level of the sea, on Ben More, in Mull.—*Mr. Trevelyan*.

Tree; flowering in March and April.

The Aspen is a rapid-growing tree, soon attaining maturity, and of short duration. It appears to be one of the more generally distributed trees, being found in all parts of Europe, Asia Minor, and Caucasus. It is very abundant in Russia, is common about Constantinople, and in Greece.

The *wood* is white and soft, and is used by turners, coopers, sculptors, engravers, &c.; it is also much used in the making of trays, clogs, wooden vessels, &c. For building purposes it is not much esteemed, and whenever it is used it must be put in a dry part of the building; if it is exposed to moisture it soon decays. As a fuel it is not good or pleasant in open fires, but for heating ovens it is one of the best. The *bark* is sometimes used, like that of the other species for tanning, and according to Linnæus the favourite food of beavers. Dried and powdered, in doses of half a pound, it is said to be a useful vermifuge for horses. In Russia, according to Pallas, a decoction of it is used in domestic medicine in scorbutic and other cases. The *leaves* are a favourite food of cattle, sheep, and goats; and in France, Germany, &c., they are given to them both green and when dried, as winter provender. So nicely balanced are the leaves on their compressed footstalks, that, as the poet says—

————— “When zephyrs wake,
The Aspen’s trembling leaves must shake.”

The constant quivering motion of the leaves renders the Aspen tree a favourite subject of poets. Sir W. Scott alludes to it in the following lines:—

“Oh, woman! in our hours of ease
Uncertain, coy and hard to please,
And variable as the shade
By the light quivering Aspen made,
When pain or sickness rends the brow,
A ministering angel thou.”

"Old Gerard" quaintly compared the leaves of the Aspen to women's tongues, "which seldom cease wagging;" but one of the most remarkable notions respecting this tree is that which Lightfoot tells us is entertained by the Highlanders of Scotland, that our Saviour's Cross was made of its wood, and for which reason they suppose that its leaves can never rest; an allusion to this superstition, and the rustling noise they make by rubbing one on the other, occurs in the following lines of Mrs. Hemans:—

—————"The rustic doth assign
To the strange restlessness of those wan leaves!
The cross he deems, the blessed cross whereon
The meek Redeemer bow'd his head to death,
Was framed of Aspen wood; and since that hour,
Through all its race the pale tree hath sent down
A thrilling consciousness, a secret woe,
Making them tremulous, when not a breeze
Disturbs the airy Thistle down, or shakes
The light lines of the shining Gossamer."

As an ornamental tree in landscape gardening it is esteemed when standing alone, or on the border of plantations, in wet situations; but on open lawns or pastures it is objectionable, on account of the great number of suckers which it puts up: its light airy appearance, and the constant motion of its leaves, are, however, its great recommendations.

4. *P. nigra*, Linn. (Fig. 1550.) *Black Poplar*. Leaves triangular, ovate, acuminate, serrated, smooth; branches spreading; fertile catkins long, cylindrical, pendulous; stigmas four.

English Botany, t. 1910.—English Flora, vol. iv. p. 245.—Hooker, British Flora, ed. 4. vol. i. p. 377.—Lindley, Synopsis, p. 238.

β. viridis. Branches green, leaves broader.

Lindley, Synopsis, p. 238.

A large spreading much branched *tree*, from fifty to eighty feet high, with a yellowish ash-coloured bark, becoming darker, and cracked by age, downy when young, becoming smooth. *Leaves* triangular, ovate, with an acuminate point, serrated, with rather obtuse teeth, almost entire towards the point and at the base, dark green above, and smooth, paler beneath, and somewhat downy when young, the *footstalks* rather short, compressed, and more or less hairy, becoming quite smooth. *Catkins* long, cylindrical, lax, pendulous, appearing before the leaves, the *barren* ones a dark reddish colour from its numerous anthers, the *scales* in it as well as the *fertile* ones palmate, hairy, sometimes smooth. *Germen* slender, ovate, enveloped at the base with the cup-shaped perianth. *Stigmas* four, awl-shaped, reddish, spreading. *Seeds* very cottony.

Habitat.—Watery places, the banks of rivers, &c.

Tree; flowering in March.

The *wood* of this tree, and its applications to economical purposes,

are similar to that of *P. alba*. The bark is used in Russia for preparing Morocco leather, and in England the same as that of the Oak. In times of scarcity the bark is pulverised, and given to sheep in Russia and in Kamtschatka, and in Norway the poor inhabitants are sometimes driven to the necessity of drying and powdering the inner bark, and mixing it with oatmeal to make their bread. The outer bark is light, thick, and used by fishermen to suspend their nets, and often used as corks for bottles, &c. The buds bruised in boiling water give out a fatty matter, which burns like wax, and exhales during its combustion a fragrant odour. The young shoots are slender and pliant, and may be applied to some of the purposes of the Willow. The cottony substance enveloping the seeds has been used in France and Germany for making wadding, paper, &c.; but from its being short and brittle, it does not so far answer the purpose of the manufactories as to be worth the expense of collecting. It is not a tree much esteemed in landscape gardening, on account of its large size; and though useful in many situations on account of its rapid growth, until other trees have increased sufficiently, it is but seldom selected as ornamental on its own account.

GENUS X. RHODIOLA.—LINN. *Rose root.*

Nat. Ord. CRASSULACEÆ. DE CAND.

GEN. CHAR. *Perianth* double. *Calyx* four-partite, small. *Petals* four, oblong, narrow. *Glands* four, emarginate. *Barren flowers* with eight spreading stamens, *Fertile flowers* with four carpels, single celled, many seeded.—Name from *ῥόδον*, a *rose*; in allusion to the scent of the roots.

1. *R. rosea*, Linn. (Fig. 1551.) *Rose-root*. Leaves oblong, smooth, fleshy, serrated at the tip.

English Botany, t. 508.—English Flora, vol. iv. p. 246.—Hooker, British Flora, ed. 4. vol. i. p. 377.—*Sedum Rhodiola*, Des.—Lindley, Synopsis, p. 64.

Root large, somewhat woody, and when recently dried with an agreeable smell, something like roses. *Stems* several, about eight inches high, simple, smooth, leafy. *Leaves* numerous, scattered, sessile, oblong, acute, entire below, serrated towards the point, a glaucous green, somewhat fleshy, turning reddish, especially on the barren plant. *Flowers* in terminal cymose clusters, yellow, agreeing with *Sedum* in their structure, but differing in the number of their parts, and nearly allied to *S. Telephium*.

Habitat.—Wet rocks on the higher mountains in the North of England and Ireland, and especially in the North-west of Scotland.

Perennial; flowering in May and June.





1652

Mercurialis perennis.



1653

Mercurialis annua.



1654

Hydrocharis morsus-ranae.



1655

Juniperus communis.



1656

Juniperus communis. var. nana.



1657

Taxus baccata.

ORDER VII.

ENNEANDRIA. 9 STAMENS.

GENUS XI. MERCURIALIS.—LINN. *Mercury*.

Nat. Ord. EUPHORBIA'CEÆ. JUSS.

GEN. CHAR. *Perianth* single, three-partite. *Barren flowers* with nine to twelve *stamens*, the *anthers* of two globose lobes. *Fertile flowers* with two *styles* from a furrow on each side of the ovary. *Capsules* two celled, each cell single seeded.—So called because it is said the god Mercury discovered the virtues of this plant.

1. *M. peren'nis*, Linn. (Fig. 1552.) *Perennial or Dog's Mercury*. Root creeping; stem quite simple; leaves rough, ovate lanceolate, petiolate; fertile flowers on long peduncles.

English Botany, t. 1872.—English Flora, vol. iv. p. 248.—Hooker, British Flora, ed. 4. vol. 1. p. 377.—Lindley, Synopsis, p. 228.

Root perennial, widely creeping. *Stem* erect, simple, about a foot high, square, leafy, hairy or smooth. *Leaves* opposite, on short foot-stalks, ovate or ovate lanceolate, dark green above, paler beneath, and rough, with short hairs, the margin obtusely serrated. *Stipules* small, ovate, reflexed. *Flowers* in interrupted axillary spikes, the *barren* ones as long or longer than the leaves, the *fertile* ones shorter. *Fruit* two globose cells, attached to a column, rough, with rigid hairs, each lobe single celled, containing a globose seed.

Habitat.—Woods and shady places; abundant.

Perennial; flowering in April and May.

This plant is possessed of poisonous properties, and is found to be deleterious both to man and animals. It causes, when taken, vomiting and purging, which is succeeded by coma and death. The accidents which have arisen from it, have been by turning sheep or cattle into fields or woods, where it grows abundantly; and when there is a deficiency of other green food, and to man accidental poisoning has occurred, from the plant having been mistaken for *Chenopodia* and other pot-herbs. The young plants turn blue in drying, but when they are in fruit they retain their green colour.

2. *M. ann'ua*, Linn. (Fig. 1553.) *Annual Mercury*. Root fibrous; stem branched; leaves smooth, ovate lanceolate, or ovate, petiolated; fertile flowers nearly sessile.

English Botany, t. 559.—English Flora, vol. iv. p. 248.—Hooker, British Flora, ed. 4. vol. i. p. 377.—Lindley, Synopsis, p. 228.

Root much branched, fibrous. *Stem* erect, from six to twelve inches high, angular, smooth, much branched and leafy above. *Leaves* opposite, ovate lanceolate, or lanceolate, smooth, shining

green, serrated on the margin, paler beneath, the *footstalk* short, with a pair of small *stipules* at the base. *Flowers* small, pale, greenish yellow, the *barren* ones in interrupted axillary spikes, longer than the leaves, the *fertile* ones on short axillary stalks, few flowered. *Fruit* two globose cells, attached to a central column, rough, with rigid spiny hairs, each lobe containing a single seed.

Habitat.—Waste places about towns and villages; less common than the last.

Annual; flowering in August.

This is readily distinguished from the last species, by its branched bushy stem and smaller narrower smooth brighter green leaves. It appears to be less deleterious than the *M. perennis*, abounding more in mucilage; and when boiled, it is eaten like spinach in some parts of Germany, but the water in which it has been boiled becomes possessed of cathartic and diuretic properties, and has, consequently, been used medicinally. It was formerly in the list of our *Materia Medica*, and esteemed as an emmenagogue, but it is now out of use. An interesting circumstance illustrating the irritability of flowers was first observed in this plant by the late esteemed Professor Burnett: he says, "This species, which is dioecious, is peculiarly interesting, from the irritability of its flowers, the stameneous ones becoming loosened from their footstalks when mature, and vaulting elastically to the neighbouring pistilline plants."

GENUS XII. HYDROCHARIS.—LINN. *Frog-bit*.

Nat. Ord. HYDROCHARIDÆ. JUSS.

GEN. CHAR. *Barren flowers*, *spatha* two partite, three flowered. *Perianth* double. *Calyx* in three deep segments. *Corolla* three spreading petals. *Stamens* nine, in three rows on the abortive ovary. *Fertile flowers*, *spatha* sessile, single flowered. *Perianth* like that of the barren flowers, and with six filiform abortive stamens. *Styles* six. *Stigmas* wedge-shaped, bifid. *Capsules* coriaceous, roundish, six celled, many seeded.—Named from *ὕδωρ*, water; and *ἡχαρς*, to rejoice; from delighting in watery places.

1. *H. Mor'sus Rana*. Linn. (Fig. 1554.) *Common Frog-bit*.

English Botany, t. 808.—English Flora, vol. iv. p. 250.—Hooker, British Flora, ed. 4. vol. i. p. 377.—Lindley, Synopsis, p. 254.

Floating upon the surface of the water, sending out slender horizontal *stems*, and long thread-shaped radicles, divided and feathery at the extremities. *Leaves* roundish, heart-shaped, flat, smooth, of a thin pellucid texture, three or five ribbed, on a long footstalk, floating on the surface of the water. *Flowers* rather large, white. *Calyx* of

the small segments. *Corolla* three, broadly ovate petals, with a short claw, and waved or crimped on the margin. The *barren* flowers sub-umbellate, from the base of a pale thin membranous sheathing spatha, elevated on a round slender stem. *Fertile* flowers solitary, on a long stem, arising from the bottom of a sessile spatha.

Habitat.—Ditches and pools in England and Ireland. "Scarcely found in Scotland."

Perennial; flowering in July.

The flowers of this pretty aquatic plant are very ornamental to our pools and ditches, and might be introduced into garden ponds, &c., amongst other aquatic plants. Its leaves are so pellucid, that, with the aid of a magnifying glass, the circulation of the sap through its vessels can be distinctly seen. Flowers with six petals are occasionally found; and Ray mentions having found double flowered ones very sweet scented in the Isle of Ely, but it does not appear to have been noticed since his time.

ORDER VIII.

MONADEL'PHIA. *Stamens combined.*

GENUS XIII. JUNIPERUS.—LINN. *Juniper*.

Nat. Ord. CONIFERÆ. JUSS.

GEN. CHAR. *Barren flowers*, scales of the *catkins* ovate, sub-peltate. *Stamens* four to eight, single celled. *Fertile flowers*, *catkins* globose, its scales few, at length united, becoming fleshy, and surrounding the berry. *Stigma* gaping. *Berry* composed of three bony single seeded *nuts*.—Name *jenepirus*, in Celtic; *rude*, *rough*, as is the plant.

1. *J. communis*, Linn. (Fig. 1555.) *Common Juniper*. Shrubby. Leaves three in a whorl, spreading, linear, subulate, with a pungent point, smooth and channeled above, obtusely keeled at the back, longer than the ovate black pruinous berry.

English Botany, t. 1100.—English Flora, vol. iv. p. 251.—Hooker, British Flora, ed. 4. vol. i. p. 377.—Lindley, Synopsis, p. 241.

β. nana, Hook. Small, procumbent, with broader leaves.

Hooker, British Flora, ed. 4. vol. i. p. 377.—*J. nana*, Willd.—English Botany Suppl. t. 2743.—English Flora, vol. iv. p. 252.—Lindley, Synopsis, p. 241.

A *shrub* of very variable size, from a low prostrate plant to an erect bush several feet high, the younger branches quadrangular, furrowed. *Leaves* evergreen, linear, subulate, acuminate into a pungent point,

smooth, channeled and glaucous above, keeled and dark green beneath, the edges smooth or roughish. *Flowers* yellow, axillary, small, the *barren* ones with stamens, furnishing a large quantity of pollen, *fertile* flowers on short scaly stalks, greenish. *Fruit* a nearly globular berry, black, with a tinge of a glaucous bloom, rather sweet, with a bitter turpentine flavour.

Habitat.—Woods and heaths. β . common in the mountains of Wales, Scotland, and Ireland.

Shrub; flowering in May.

The Juniper is a common plant in most parts of Europe, growing upon almost every different kind of soil, and in elevated situations or on plains, consequently it is very variable in its size. Most frequently it is only a low procumbent bushy plant, but grown in situations favourable to its developement, it forms a bush several feet high, Its wood is very hard and durable, its bark tough and fibrous, and may be formed into ropes for common purposes; a whitish kind of gum exudes from it, which is known in the shops by the name of Sandarach, which, when finely powdered, is sold under the name of *pounce*. The berries are used for the purpose of flavouring ardent spirits, with which, when they are distilled, they impart their peculiar aromatic odour, depending upon the presence of a volatile oil. It is this which gives the flavour and diuretic properties to Hollands, and it is also supposed to be used for the same purpose in English gin, but it is believed that in England they often use oil of turpentine. The oil collected by distillation possesses diuretic properties, and has been used in medicine, but it is only now used as an adjunct to other matters, such as squills, and digitalis, and is not trusted alone. When the berries are boiled with water, they give out a quantity of sugar, which, according to Linnæus, when fermented, forms a common drink in Sweden.

Allied to the Juniper are the *Thuja*, the *arbor vita*, or tree of sacrifice, so called from its wood being used in sacrifices, because it gave out a pleasant odour during combustion; and the *Cypressus*, or *cypress tree*, well known from its tall stately growth and sombre aspect, and the durability of its wood. The chests containing the Egyptian mummies, and the gates of St. Peter's Church at Rome were made of cypress wood. The latter lasted from the time of Constantine to that of Pope Eugene IV., a period of about eleven hundred years, and were not then decayed.

GENUS XIV. TAX'US.—LINN. *Yew*.

Nat. Ord. CONIFERÆ. JUSS.

GEN. CHAR. *Catkins* scaly at the base. *Barren flowers*, with from eight to ten *stamens*, the *filaments* united. *Anthers* peltat', six.

to eight celled, the cells opening beneath. *Fertile flowers*, with a concave sessile *stigma*. *Fruit* a succulent *drupe*, gaping at the apex. *Nut* single seeded.—Name, *τοξον*, an *arrow*; which word, according to Vossius, was given to this tree, because arrows were formerly poisoned with its juice.

1. *T. baccata*, Linn. (Fig. 1556.) *Common Yew*. Leaves two, ranked, crowded, linear, acute, flat; flowers axillary, sessile.

English Botany, t. 746.—English Flora, vol. iv. p. 258—Hooker, British Flora, ed. 4. vol. i. p. 378.—Lindley, Synopsis, p. 241.

A low tree, with a straight trunk, often of considerable diameter, and variously furrowed, with deep longitudinal channels, the bark smooth, falling off in long scales, the branches spreading horizontally, when young green, smooth, furrowed. *Leaves* crowded, more or less two ranked, linear, acute, about an inch long, dark green above, and shining, somewhat paler beneath, quite smooth, with a prominent mid-rib. *Flowers* axillary, solitary, the barren ones pale brown, and scaly at the base. *Stamens* numerous, large, furnished with abundant pollen, *fertile flowers* small, green, scaly at the base, becoming enlarged, tumid and succulent. *Style* none. *Stigma* obtuse. *Fruit* a nut, enclosed in a succulent cup, formed of the enlarged calyx, a bright scarlet, soft, sweet, and glutinous

Habitat.—Mountain woods, especially in limestone districts
Tree; flowering in March.

The *Irish* or *Florence Court Yew*, a tree not uncommon in our gardens, has the leaves more scattered, and the fruit oblong. It may be a distinct species, and is the *T. fastigiata* of Lindley's Synopsis; but if a species it "is not wild in Britain," according to Sir W. J. Hooker.

The Yew is a native of the mountainous districts of all parts of Europe, North America, and in Japan. It lives for a very long period, and attains an enormous size: one in Braburn Church yard, in Kent, measured about twenty feet in diameter. The Cowhurst Yew, near Hastings, is more than thirty feet in circumference; but the Fortingal Yew, in the Church-yard at the entrance of Glen Lyon, in Perthshire, when seen by Pennant measured fifty-six and a half feet in circumference, or about eighteen feet in diameter: it was then a mere shell, but was alive and flourishing. Many other trees might be mentioned, showing to what an enormous size the Yew grows; one called the Hedsor Yew, growing in the woods of Cliefden, measures twenty-seven feet in diameter, or about eighty-one feet in girth. This enormous tree is still in health and flourishing.

The wood of the Yew is hard, heavy, and extremely durable, of a red colour, prettily veined, and smooth, and consequently much esteemed by turners and cabinet-makers, and carvers in wood. Many of the beautiful and useful articles made in Switzerland are of

this wood. For millwright work, flood gates, and other wood works in trying and exposed situations, it is much esteemed; and formerly, before the invention of gunpowder, the Yew was one of our most important trees as furnishing our yeomen with bows. Their skill in the use of the long bow, the most important weapon known in the wars of our early Sovereigns, was the proud distinction of English yeomen. So great was the demand for this wood in these times of archery, that our native trees could not supply the demand, and so important was its use that various laws concerning it were enacted from the time of Edward the Fourth to that of Queen Elizabeth. It was imported from abroad in considerable quantities, and it is said that every ship trading to Venice was obliged to bring ten bow-staves along with every butt of malmsey wine, and it is the opinion of some persons that the great demand for the wood at that period was the reason the Yew was so often planted in Church-yards. This is not, however, very likely to have been the case, but rather, as Ray says, our ancestors planted the Yew in Church-yards because it was an ever-green tree, as a symbol of that immortality which they hoped and expected for the persons there deposited.

"Now from yon black and funeral *yew*,
That bathes the charnel house with dew.
Methinks I hear a voice begin;
(Ye ravens, cease your croaking din,
Ye tolling clocks, no time resound,
O'er the long lake and midnight ground!)
It sends a peal of hollow groans,
Thus speaking from among the bones."

Parnell.

It was a practice formerly observed, and is so still, in some parts of Ireland and Wales, to carry twigs of this and other evergreens, &c., to funerals, by the mourners, and afterwards throw them into the grave with the coffin.

"Throw by the lily, daffodil, and rose,
Wreaths of black *yew*, and willow pale compose,
With baleful hemlock, deadly night-shade dress'd,
Such chaplets as may witness thine unrest,
If ought can witness. O ye shepherds tell,
When I am dead, no shepherd loved so well!"

A. Philips.

The Yew tree, when allowed to grow in its natural shape, and advanced to a good old age, is one of our handsomest evergreens; from, however, its being one of the most patient trees, it bears clipping and torturing perhaps more than any other, and when the fashionable taste was to have long formal hedges, and trees cut into the form of men, animals, &c., the Yew was the most frequently em-

played. There are not many remains of this taste. Between Henley and Oxford there are two cut into the form of peacocks, and in Bedford Church-yard there are two others, "which have now been upwards of a century and a quarter reduced to such an unnatural condition, their yearly shoots being annually clipped off; and there is no chance of escape for these metamorphosed trees, an annuity having been left by some eccentric person to keep these Yews thus cut for ever."

The leaves are poisonous to some animals, though deer, sheep, and goats, it is said, eat them with impunity, but cows and horses soon die after having eaten only small quantities of them. Fatal accidents occurring to these animals are not unfrequent.

The pulp of the fruit is sweet and mucilaginous, with a sickly taste, and is quite harmless; but the seeds are said to be very unwholesome. The propagation of the tree is either from the seeds or suckers.

The medicinal properties of Yew tree leaves are said by some Italian physicians to have an effect when administered to man similar to that of Digitalis, in reducing the action of the heart and arteries: this medicine is said to have an advantage over the use of Digitalis, that it does not accumulate in the system, being consequently more manageable. In the Pharmacopea del Prof. Antonio Campana, it is stated to be given in inflammations, peripneumonia, and asthma, often with such effect as to obviate the necessity of abstracting blood. The dose is stated to be from six to thirty grains of the powdered leaves, repeated every two hours.

CLASS XXIII.

POLYGAMIA.

(Stamens and Pistils separate, or united on the same, or on different plants, and having two different kinds of perianth).

ORDER I.

MONOECIA.

(Flowers different on the same plant).

GENUS I. ATRI'PLEX.—LINN. ORACHE.

Nat. Ord. CHENOPO'DEE. JUSS.

GEN. CHAR. *Burden and united flowers, perianth five partite. Stamens five. Pistils imperfect, rarely perfect. Fertile flowers, the*

perianth single, of two valves, compressed, becoming larger after flowering, and covering the seed. *Style* bifid. *Fruit* an *article*, with a single vertical *seed*, albuminous, its *testa* crustaceous, attached by a lateral hilum near the base, or to the middle of the side, by means of an elongated funiculus. *Pericarp* membranous, free.—Name from *α*, not; and *τρέφω*, to nourish (?)

1. *A. erecta*, Huds. (Fig. 1557) *Upright Spear-leaved Orache*. Stem herbaceous, mostly erect, with ascending branches; lower leaves ovate oblong, with two ascending lobes, from a wedge-shaped base, and irregularly toothed, the upper ones lanceolate, entire; flowers in close spikes, branched; perianth of the fruit rhomboidal, acute, toothed, more or less mucronated at the back, and scarcely longer than the fruit.

English Botany, t. 2223.—English Flora, vol. iv. p. 259.—Hooker, British Flora, ed. 4. v. i. p. 379.—Lindley, Synopsis, p. 217.

Stem mostly erect, with numerous upright or ascending branches, leafy. *Leaves* alternate, on footstalks, the lower ones ovate oblong, with an ascending lobe on each side, from a wedge-shaped base, and more or less irregularly and deeply toothed, the upper leaves gradually becoming narrower, linear lanceolate, and entire, all slightly powdery or scaly. *Inflorescence* a terminal many flowered dense branched spike. *Perianth* of the fruit two rhomboidal acute valves, toothed on the margin, and more or less mucronated at the back a little longer than the seeds. *Seeds* compressed, smooth, shining, black.

Habitat.—Waste and cultivated land; not unfrequent.

Annual; flowering in August.

2. *A. prostrata*, (Bouch?) (Fig. 1558.) *Prostrate Orache*. Stem procumbent, with procumbent spreading branches; leaves opposite, the lower ones triangular hastate, with two horizontally spreading lobes at the base, entire, or slightly toothed, the intermediate ones with two ascending lobes, from a wedge-shaped base, and the upper ones small, entire, lanceolate; flowers in interrupted slightly branched spikes; the perianth of the fruit cordate, triangular, entire, or slightly toothed, scarcely longer than the fruit.

Babington's Manual of British Botany, p. 252.—*A. oppositifolia*, Koch.

Stem and branches procumbent, spreading, from six to twelve or eighteen inches long. *Leaves* opposite and alternate, on rather long footstalks, the lower ones triangular, hastate, with its lobes horizontally, spreading, some are entire, others toothed, the intermediate leaves have the lobes smaller, more acute, and ascending, while the upper ones are small, entire, and lanceolate, all are of a fleshy texture, and more or less scattered over with powdery scales. *Inflorescence* axillary clusters, forming at the top of the branches,



1558

Atriplex erecta.



1559

Atriplex prostrata.



1560

Atriplex patula



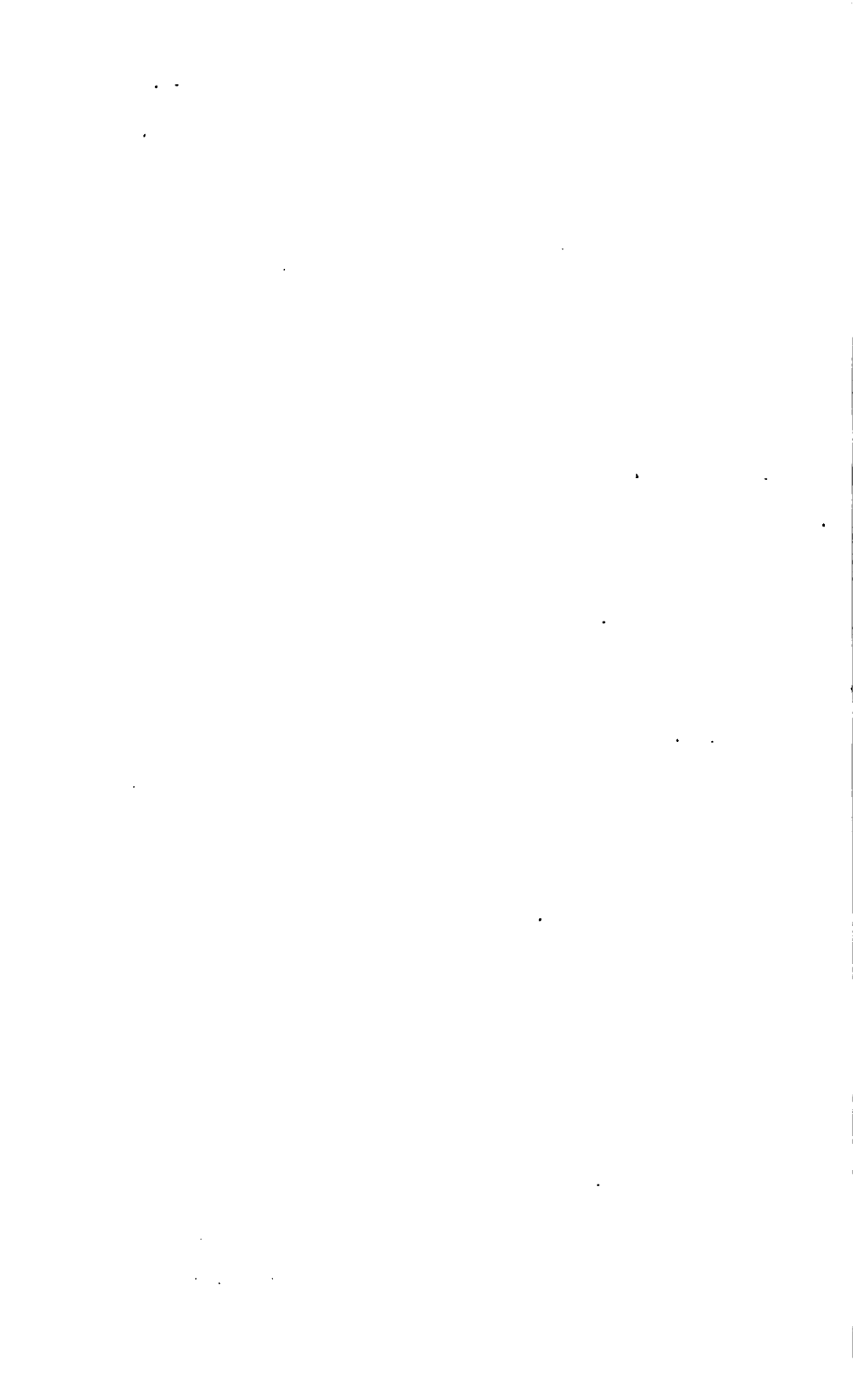
1561

Atriplex deltoidea.



1562

Atriplex rosea.



naked, and sometimes slightly branched spikes. *Perianth* of the fruit triangular, heart-shaped, ribbed, mealy and entire, or toothed on the margin, a little longer than the dark brown compressed seed.

Habitat.—Sea coast, rare? Helensburg, Scotland, where we found it abundant.

Annual; flowering in July and August.

This is a remarkable plant, from the character of its leaves, the shape of the perianth, and the mode of its inflorescence. It spreads its branches close to the surface of the soil, and is often so much branched at the base as to appear almost tufted. Its branches are sometimes eighteen inches long, but mostly not more than four to six and eight.

3. *A. patula*, Linn. (Fig. 1559.) *Spreading hulbert-leaved Orache*. Stem mostly erect, with ascending branches; leaves green, smooth, the lower ones ovate, hastate, with two horizontally spreading lobes, irregularly toothed, the upper ones lanceolate, nearly entire; flowers in interrupted spikes; the perianth of the fruit triangular, rhomboidal, nearly entire, slightly mucated at the back, longer than the seeds which are opaque and roughish.

English Botany, t. 936.—English Flora, vol. iv. p. 257.—Hooker, British Flora, ed. 4 vol. i. p. 379.—Lindley, Synopsis, p. 217.

Root fibrous. *Stem* mostly erect, with long spreading or ascending branches, of a dark green or sometimes a reddish colour. *Leaves* numerous, dark green, occasionally mealy at the back, on rather long footstalks, alternate or opposite, the lower ones ovate, hastate, having two acute horizontally spreading lobes at the base, and more or less toothed, with unequal sharp scattered teeth, the upper ones lanceolate or linear, entire, or slightly toothed. *Inflorescence* terminal and axillary interrupted crowded naked spikes, with the flowers in unequal clusters. *Perianth* of the fruit enlarged, triangular, rhomboidal, entire or toothed on the margin, especially towards the base on each side, and mucated at the back, longer than the roundish compressed opaque seeds.

Habitat.—Cultivated and waste ground; common.

Annual; flowering in July.

This is a very common and variable species, especially in the size of the perianth of the fruit, and in its being entire or toothed more or less deeply, as well as being smooth or mucated at the back, and the leaves being entire, toothed, or the lobes at the base larger or smaller.

4. *A. microsperma*, W. and K. *Glittering Seeded Orache*. "Stem erect or ascending, with ascending branches; leaves opposite, lower leaves ovate lanceolate, with two horizontally spreading lobes, denticulate; upper leaves lanceolate, subulate, hastate, entire; perianth of the fruit ovate, triangular, acutish, entire, rough on the back,

slightly longer than the fruit, collected in a branched densely flowered panicle; seeds smooth and shining."

Babington's Manual of British Botany, p. 253.—*A. ruderalis*, Koch. in Fl. 798.

With this species we are unacquainted; but Mr. Babington, from whose Flora we have extracted the above description, says that it is distinguished from all the others by the form of its perigone (perianth), in conjunction with its leaves and panicle.

Habitat.—Waste ground; rare. Bath.

Annual; flowering in July to September.

5. *A. deltoidea*, Bab. (Fig. 1560.) *Triangular-leaved Orache*. Stem erect, with opposite ascending branches; leaves opposite, all hastate, triangular, with two descending lobes, unequally dentate or sinuate dentate; perianth of the fruit ovate, triangular, dentate, and more or less mucronate at the back, somewhat longer than the smooth shining seeds, and collected into branched dense many flowered panicles.

English Botany Suppl. t. 2860.—Babington's Manual of British Botany, p. 253.

Stem erect, from two to three feet high, with long slender opposite branches, leafy. *Leaves* opposite, triangular, hastate, with the two lateral lobes more or less acute, and pointing downwards, toothed, sometimes also sinuated, and often entire, especially the upper ones, a bright green above, paler and somewhat powdery beneath, the foot-stalk dilated towards the leaf, the floral leaves are short, lanceolate. *Inflorescence* dense flowered panicles, branched and spreading. *Perianth* of the fruit triangular, ovate, entire or toothed on the margin, and more or less mucronate at the back, a little longer than the smooth compressed dark shining seeds.

Habitat—Waste and cultivated places; not uncommon.

Annual; flowering from July to September.

This species we find very common on waste places not far from the sea, in various parts of Italy; but most frequent among the sea coast plants near Leghorn.

6. *A. rosea*, Linn. (Fig. 1561.) *Spreading Orache*. Stem procumbent, or ascending, with numerous spreading branches; leaves ovate, triangular, unequally sinuate, dentate, the lower ones sometimes three lobed, the upper ones ovate lanceolate, toothed, or nearly entire; perianth of the fruit rhomboidal, acute, toothed, with two rows of tubercles on the back, or simply ribbed, collected in small axillary clusters and small terminal spikes; seeds minutely rugose.

Babington's Manual of British Botany, p. 258.

Stem prostrate, or ascending, with numerous alternate slender spreading branches, often of a reddish colour, covered over with mealy scales. *Leaves* alternate below, mostly opposite above, white, with mealy scales, ovate, triangular, often three lobed, with a three ribbed

wedge-shaped base, unequally toothed, sinuated, or entire, the upper leaves entire or toothed, or lobed lanceolate. *Inflorescence* axillary clusters of few flowers, crowded above into a short interrupted spike, the *perianth* of the fruit rhomboidal, acute, much dilated, flat, the upper margin toothed, with prominent ribs at the back, the lateral ribs sometimes furnished with clusters of tubercular excrescencies, larger than the seeds. *Seeds* compressed, minutely tubercular, rugose.

Habitat.—Sea shore; common.

Annual; flowering in July and August.

This is an extremely variable plant, both in size and the shape of the leaves. Its most constant characters are that of the large size and shape of the perianth, and the roughness of the seeds. The plant is frequent on the shores of the Mediterranean, where it grows to a greater size, and is more mealy than with us.

7. *A. laciniata*, Linn. (Fig. 1562.) *Cut-leaved Orache*. Stem procumbent, with spreading branches; leaves very mealy beneath, triangular, rhomboidal, laciniated, or toothed, the upper hastate, oblong; barren flowers in terminal naked spikes, the fertile ones axillary; the perianth becoming much enlarged, rhomboidal, three lobed, the lateral lobes truncate, three ribbed at the back, the lateral ribs often tuberculated; seeds rough, opaque.

English Botany, t. 265.—English Flora, vol. iv. p. 257.—Hooker, British Flora, ed. 4. vol. i. p. 378.—Lindley, Synopsis, p. 217.

Stem roundish, procumbent, with slender alternate spreading branches, frosted with mealy scales, often of a reddish colour. *Leaves* alternate below, often opposite above, on footstalks, nearly smooth, a paleish green above, white and mealy beneath, variously sinuated or toothed, often three lobed, in a rhomboidal or hastate manner, the upper floral ones often quite entire, ovate lanceolate, or linear. *Inflorescence* terminal and axillary, the barren flowers in more or less dense interrupted naked yellow spikes, the fertile flowers axillary, solitary, or several together, the perianth becoming much enlarged, triangular, three lobed, laciniated or toothed, or entire, the lateral lobes truncated, ribbed and veiny at the back, the lateral ribs often becoming tuberculated, larger than the compressed rough opaque seed.

Habitat.—Sandy sea shores; not unfrequent.

Annual; flowering in July and August.

This species is remarkable, from the variable and oft deep cut and sinuated leaves, the yellow dense flowered spikes of barren flowers, and the enlarged perianth of the fertile ones. It is very common on the sea coast of Italy, but is there a much larger more branched plant than ours, though not otherwise different.

8. *A. littoralis*, Linn. (Fig. 1563.) *Grass-leaved Orache*. Stem erect, branched; leaves all linear, lanceolate, entire, or rarely toothed; perianth of the fruit ovate, rhomboidal, acute, toothed, warty at the back, spreading.

English Botany, t. 708.—English Flora, vol. iv. p. 260.—Hooker, British Flora, ed. 4. vol. 1. p. 379.—Lindley, Synopsis, p. 217.

β. marina. Leaves toothed, perianth of the fruit closed.

A. marina, Linn. Babington's Manual of British Botany, p. 252

Stem erect, from one to two feet high, angular, striated, smooth, with numerous erect branches. *Leaves* alternate and opposite, smooth, dark green, somewhat powdery beneath, of a leathery texture, petiolated, linear, or linear lanceolate, quite entire, occasionally slightly toothed. *Inflorescence* terminal and axillary, interrupted, obtuse, spikes leafy, formed of dense clusters of small flowers. *Perianth* of the fruit enlarged, powdery, rhomboidal, ovate, acute, toothed on the margin, and more or less tuberculated at the back, spreading. *Seed* roundish, acute, compressed.

Habitat.—Muddy salt marshes, not unfrequent, especially on the east coast.

Annual; flowering in July and August.

This species is known by its open perianth, and the leaves being narrow, linear, and almost always entire. The leaves become almost black with drying, and abound in alkaline salt; but it has not, that we are aware, been applied to any particular use.

9. *A. angustifolia*, Smith. (Fig. 1564.) *Spreading narrow-leaved Orache*. Stem erect, or prostrate, striated, branched, and spreading; leaves lanceolate, entire, the lower ones with two ascending lobes, from a wedge-shaped base; perianth of the fruit rhomboidal, acute, entire, with an acute ascending lobe on each side, smooth, reticulated at the back, longer than the smooth shining seeds; spikes interrupted.

English Botany, t. 1774.—English Flora, vol. 4. p. 258.—Hooker, British Flora, ed. 4. vol. 1. p. 379.—Lindley, Synopsis, p. 217.

Stem erect, or prostrate, more or less branched and spreading, round, striated, smooth. *Leaves* opposite and alternate, petiolate, of a leathery texture, dark green, lanceolate, entire, or slightly toothed, the lower ones occasionally with an entire ascending lobe on each side, from the wedge-shaped base. *Inflorescence* interrupted spikes of crowded flowers. *Perianth* of the fruit becoming much enlarged, of a rhomboidal acute form, entire, with an acute ascending lobe on each side, smooth, but often with prominent reticulations at the back. *Seeds* small, smooth, and shining.

Habitat.—Waste and cultivated places; frequent.

Annual; flowering from June to August.



1863

Atriplex laciniata.



1864

Atriplex littoralis.



1865

Atriplex angustifolia.



1867

Halimus pedunculata.



1866

Halimus portulacoides.



GENUS II. HAL'IMUS.—WALLR. *Sea Purslane.*

Nat. Ord. CHENOPOD'EE. JUSS.

GEN. CHAR. *Barren and united flowers, perianth five partite. Stamens five. Pistils imperfect, rarely perfect. Fertile flowers, perianth of two parts, united to the extremity, three toothed, wedge-shaped below, becoming larger after flowering, and enclosing the seed. Stigmas two. Fruit an urticle, with a single vertical seed, albuminous, its testa membranous, pendulous, from an elongated funiculus, radical terminal. Pericarp very thin, ultimately adhering to the tube of the perianth.*

1. *H. portulacoides*, Wallr. (Fig. 1565.) *Shrubby Sea Purslane.* Stem woody; leaves opposite, obovate lanceolate, entire, attenuated below, white and silvery; perianth of the fruit triangular, oblong, rounded below, on a short footstalk, three lobed above, and mucricated at the back.

Atriplex portulacoides.—English Botany, t. 261.—English Flora, vol. iv. p. 256.—Hooker, British Flora, ed. 4. vol. i. p. 378.—Lindley, Synopsis, p. 216.

Root woody, somewhat creeping, much branched. *Stem* one to two feet high, woody, branched, ascending, white and hoary, round below, square above. *Leaves* opposite, obovate oblong, obtuse or acute at the point, tapering at the base into a footstalk, the lower ones sometimes becoming almost hastate, white, with silvery mealiness on both sides, but especially beneath. *Inflorescence* terminal branched and axillary interrupted spikes. *Flowers* reddish green, in small lateral tufts, some having styles only, others bearing styles and stamens, and again others with stamens only. *Perianth* of the fruit becoming enlarged, of a triangular oblong figure, rounded below, on a short footstalk, two valved, three lobed, and united to nearly the end, mucricated at the back.

Habitat.—Muddy sea shore; not unfrequent.

Shrub; flowering in July and August.

This is a low branched shrub, becoming larger by cultivation, and is rather ornamental, on account of its silvery looking leaves. It is common on all the sea coasts of Europe, but has not been applied to any particular use, although the whole plant abounds with soda.

2. *H. pedunculata*, Wallr. (Fig. 1566.) *Stalked Sea Purslane.* Stem herbaceous, wavy, branched, spreading; leaves ovate, entire, tapering at the base, the upper ones narrower; perianth triangular, with two large lobes, and a small intermediate one, on long footstalks.

Atriplex pedunculata, Linn.—English Botany, t. 232.—English Flora, vol. iv. p. 261.—Hooker, British Flora, ed. 4. vol. i. p. 379.—Lindley, Synopsis, p. 217.

Root tapering. The whole plant of a silvery glaucous hue. *Stem* erect, from a few inches to a foot high, zigzag, branched, angular, leafy. *Leaves* ovate lanceolate, obtuse, tapering at the base into a short footstalk, entire, of a leathery or somewhat fleshy texture. *Inflorescence* terminal and lateral interrupted spikes. *Fertile flowers* becoming elevated on a long spreading peduncle, having its *perianth* of two pieces, and when in fruit triangular, wedge-shaped, cleft into two lateral spreading obtuse lobes, with an obtuse erect tooth between them, united to near the margin. *Seed* flat, orbicular.

Habitat.—Muddy salt marshes, on the east and south-coast of England; Cunnamara, Ireland.

Annual; flowering in August and September.

SUPPLEMENT.

SYNOPTICAL TABLE OF THE BRITISH PLANTS, ARRANGED ACCORDING TO THE NATURAL ORDERS.

CLASSES.

1. VASCULARES *De Cand.*
 2. CELLULARES. *De Cand.*
- CLASS I. VASCULARES.

Substance of the plant composed of cellular tissue, woody fibre, and spiral vessels. *Leaves* formed with parenchyma, and veins, consisting of woody fibre and spiral vessels. *Epidermis* with cuticular pores. *Flowers* consisting of floral envelopes, stamens and pistilla. *Seeds* distinctly attached to a placenta, covered with a testa, and containing an embryo, with one or more cotyledons; germinating at two fixed points, viz, the plumule and radicle.—*Lindley.*

SUB-CLASSES.

1. DICOTYLEDONES, OR EXOGENOUS PLANTS.
2. MONOCOTYLEDONES, OR ENDOGENOUS PLANTS.

1. *Dicotyledones, or Exogenous Plants.*

Trunk composed of two parts, wood and bark; each increasing in width by layers deposited in inverse directions. The wood consists of a central medulla (pith), and medullary productions radiating through the new ligneous strata: of these strata the older (perfect wood) are hard and internal; the newer (alburnum) are soft white and external. The bark is covered by an epidermis, and consists of layers of cellular tissue, the older (true bark) being external, the younger (liber) internal. *Leaves* with branching and anastomosing veins. *Flowers* distinct, symmetrical, generally arranged in quinary numbers. *Embryo* usually with two opposite cotyledons, rarely more, and then verticillate.—*De Cand.*

2. *Monocotyledones, or Endogeneous Plants.*

Stems destitute of a central pith, medullary rays, or true bark, composed of scattered fibres, and not arranged in concentric circles; harder on the outside than in the centre; usually cylindrical when a terminal bud is developed; increasing in width

and length while the outside remains soft, afterwards only in length; sometimes abortive, subterranean, and root like. *Leaves* often sheathing, entire, with simple veins, or lobed with ramose veins; never truly compound. *Flowers* distinct, and generally arranged in ternary numbers; the *integument* simple in two rows, or (according to some authors) double; the pieces of each row being similar. *Embryo* with one cotyledon, or if with two then the accessory one is imperfect and alternate with the other. *Radicle* generally enclosed within the substance of the embryo.—*De Cand.*

CLASS II. CELLULARES.

Substance of the plant composed of cellular tissue chiefly, either in a spheroidal or elongated state; spiral vessels wholly absent; annual and present in some. *Cuticle* generally destitute of stomata. *Sexual organs*, and consequently flowers absent. *Reproduction* taking place either by *sporules*, which are enclosed in particular cases, called *thecæ*, or imbedded in the substance of the plant, or else by a mere dissolution of the articles of cellular tissue; *germination* occurring at no fixed point, but upon any part of the surface of the sporules.—*Lindley.*

ARTIFICIAL ANALYSIS OF THE ORDERS.

DIVISIONS.

* PHANEROGAMOUS, or PHCENOGAMOUS PLANTS. (*Flowering plants*).

Flowers present; the stamens and pistils being visible to the naked eye.

1. DICHLAMYDEOUS PLANTS. Perianth double, consisting of calyx and corolla; the parts of the flower generally in fives, and the leaves with netted veins.
 - ‡ 1. *Polypetalous Plants*. Corolla composed of two or many petals.
 - ‡ 2. *Gamopetalous Plants*. Corolla having the petals more or less united.
2. MONOCHLAMYDEOUS PLANTS. Perianth simple, of one or two rows rounded at the base, or rarely apparently double; the parts of the flower being then in threes, and the leaves with parallel veins.
3. ACHLAMYDEOUS PLANTS. Perianth wanting; the florets sometimes surrounded by a common involucre.

** CRYPTOGRAMOUS PLANTS. (*Flowerless plants*).

Flowers none; or the stamens and pistils, if any, indistinct, and not visible to the naked eye.

PHANEROGAMOUS, or PHCENOGAMOUS PLANTS.

1. DICHLAMYDEOUS PLANTS.

‡ 1. POLYPETALOUS PLANTS. (*Petals distinct*).

* Ovary or ovaries free.

		ORDER
+ Ovaries numerous.		
Calyx composed of separate sepals.....	RANUNCULACEÆ.	1
Calyx composed of sepals, more or less united at their base.		
Stamens united by their filaments into a tube	MALVACEÆ.	16
Stamens distinct.		
Leaves more or less fleshy.....	CRASSULACEÆ.	35
Leaves not fleshy	ROSACEÆ.	27
++ Ovary solitary.		
‡ Corolla regular.		

† Stamens one to six.

‡ Calyx composed of sepals more or less united at their base.

¶ Trees or shrubs.

Flowers unisexual (Dioecious)	EMPETRÆÆ.	76
Flowers hermaphrodite (containing stamens and pistils).		
Leaves small, squamiform, stamens hypogynous	TAMARISCINÆÆ.	12
Leaves not squamiform.		
Stamens inserted into the disk	CELASTRINÆÆ.	24
Stamens inserted into the corolla	ILICINÆÆ.	53

¶ Herbs.

Capsule three to five celled	†ELATINÆÆ.	14
Capsule two celled	LYTHRARIÆÆ.	28
Capsule one celled.		
Corolla consisting of five petals, slightly united at their base	PORTULACÆÆ.	33
Corolla wanting, or consisting of five small squamiform petals	†PARONYCHIÆÆ.	34
Corolla consisting of five unguiculate petals.		
Capsule many seeded.		
Placenta central	CARYOPHYLLÆÆ.	15
Placenta parietal	FRANKENIACÆÆ.	13
Capsule single seeded	PLUMBAGINÆÆ.	

‡ Calyx composed of two to six separate petals.

Stamens slightly united at the base into a monodelphous ring	LINEÆÆ.	21
Stamens distinct at the base.		
Stamens tetradynamous; viz two long and two short	CRUCIFERÆÆ.	6
Stamens not tetradynamous.		
Anthers bursting, by valves curling upwards ..	BERBERIDÆÆ.	2
Leaves alternate	DROSERACÆÆ.	10
Leaves opposite	CARYOPHYLLÆÆ.	15

‡ Stamens seven to ten.

Petals none	PARONYCHIÆÆ.	34
Petals three to nine.		
Trees	ACERINÆÆ.	19
Shrubs or Herbs.		
Leafless parasitical plants	MONOTROPACÆÆ.	51
Leafy, not parasitical plants.		
Calyx consisting of one to five sepals, or three to five lobed, or three to five toothed.		
Style single	GERANIACÆÆ.	20
Styles two to five.		
Leaves trifoliate	OXALIDÆÆ.	23
Leaves simple or divided, not trifoliate.		
Petals free	†ELATINÆÆ.	14
Petals inserted on the calyx	SAXIFRAGACÆÆ.	37
Petals inserted on the torus	CARYOPHYLLÆÆ.	15
Calyx valved, or eight or ten toothed	LYTHRARIÆÆ.	28
‡ Stamens eleven, or more.		
Petals indefinite, generally in many rows	NYMPHÆACÆÆ.	3

	ORDER
Petals definite, generally four or five.	
† Calyx with the sepals united.	
Trees or shrubs	ROSACEÆ. 27
Herbs or small under shrubs.	
Petals inserted on the thalamus	HYPERICINÆ. 18
Petals inserted on the calyx	LYTHRARIÆ. 28
†† Calyx with the sepals separate.	
Calyx of two sepals	PAPAVERACEÆ. 4
Calyx of three to eight sepals.	
Stamens monadelphous, or polyadelphous.	
Calyx valvate in aestivation, anthers one celled	MALVACEÆ. 16
Stamens distinct.	
Trees	TILIACEÆ. 17
Shrubs or herbs.	
Petals all entire	CISTINÆ. 8
Upper petals palmyti-partite	RESEDACEÆ. 7
‡‡ Corolla irregular.	
Corolla spurred at the base; stamens five or six.	
Calyx of five sepals	VIOLACEÆ. 9
Calyx of two sepals.	
Stamens six; style filiform	FUMARIACEÆ. 5
Stamens five; style none	BALSAMINÆ. 22
Corolla not spurred at the base.	
Stamens eight; anthers one celled	POLYGALÆ. 11
Stamens ten or more; stigma single	LEGUMINOSÆ. 26
** Ovary adnate to, or enclosed within the tube of the calyx.	
Ovary one celled	GROSSULACEÆ. 36
Carpels two, united with the placenta in the axis, separating when ripe from the base to the apex, and remain- ing suspended from a carpophorus; flowers um- bellate	UMBELLIFERÆ. 38
Carpels concreted into a many celled fruit; or if two celled, the cells not separating, nor the flowers umbellate.	
Stamens definite in number, two to ten.	
Shrubs or trees.	
Stamens opposite the petals, calyx four or five lobed.	RHAMNÆ. 25
Stamens alternate with the petals, calyx four or five toothed.	
Petals and stamens four, style one	CORNÆ. 40
Petals and stamens five or more, styles three or more	ARALIACEÆ. 39
Herbs.	
Ovary two celled	SAXIFRAGACEÆ. 37
Ovary many (often four) celled	ONAGRARÆ. 30
‡ 2. GAMOPETALOUS, (Petals more or less united).	
* Stamens inserted either directly on the calyx, or on the corolla, which arises from the calyx; the calyx being adherent to the ovary.	
Fruit one seeded.	
Parasitical plants, with baccae fruit	LORANTHACEÆ. 41

ORDER

Plants not parasitical, nor the fruit baccate.	
Flowers corymbose, panicle, or sub-capitate.....	VALERIANAE. 44
Flowers aggregated in a common receptacle, and surrounded by a many leaved involucre.	
Anthers united into a tube, syngenesious.....	COMPOSITE. 46
Anthers distinct.....	DIPSACE. 45
<i>Fruit two or many seeded.</i>	
Calyx free, not united to the ovary.....	PORTULACAE. 33
Calyx adnate to the ovary.	
Fruit an akene, or a dry or fleshy berry.	
Flowers monocious or dioecious, placenta parietal ..	CURCUBITACE. 32
Flowers hermaphrodite, the placenta not parietal.	
Herbs with whorled leaves and square stems	STELLATE. 43
Shrubs with rounded stems.	
Anthers opening by pores at the apex	VACCINACE. 52
Anthers opening by longitudinal chinks	CAPRIFOLIACE. 42
Fruit capsular.	
Stamens five.	
Corolla with a deep longitudinal fissure above	LOBELIACE. 48
Corolla regularly divided, five-cleft	CAMPANULACE. 47
** <i>Stamens inserted on the corolla, which arise from the torus; the calyx not being adherent to the ovary.</i>	
† <i>Fertile stamens, two to four.</i>	
Fruit consisting of a four lobed ovary, apparently of four naked seeds	LABIATE. 63
Fruit not four lobed.	
‡ <i>Fertile stamens, two.</i>	
Corolla spurred	LENTIBULARIACE. 65
Corolla not spurred, sometimes inflated.	
Herbs.....	SCROPHULARIACE. 62
Shrubs or trees.	
Corolla regular	OLEACE. 54
†† <i>Fertile stamens, four.</i>	
Corolla regular, scarious.....	PLANTAGINACE. 68
Corolla irregular coloured.	
Fruit drupeaceous, or baccate.....	VERBENACE. 64
Fruit capsular.	
Leafless parasitical plants	OROBANCHACE. 61
Leafy green, not parasitical plants.	
Seeds with albumen; embryo not foliaceous	SCROPHULARIACE. 62
†† <i>Stamens generally five (sometimes more).</i>	
Fruit follicular, the two cells distinct, or cohering by their stigmas	APOCYNACE. 55
Fruit not follicular.	
Fruit consisting of a two or four lobed ovary, apparently of two naked seeds or nuts.....	BORAGINACE. 59
Fruit a capsule.	
Stamens opposite the lobes of the corolla.....	PRIMULACE. 66
Stamens alternate with the lobes of the corolla.	
Carpels numerous, distinct.....	CRASSULACE. 35
Carpels conereted into a one or many celled capsule or berry.	

	ORDER
† Capsule few seeded.	
Style one.	
Shrubs or trees	CELASTRACEÆ. 24
Herbs.	
Calyx simple.	
Corolla plaited.....	CONVOLVULACEÆ. 56
Corolla not plaited.....	POLEMONIACEÆ. 57
Styles numerous	PLUMBAGINÆÆ. 67
‡‡ Capsule many seeded.	
Anthers appendiculated, hard and dry	ERIACEÆ. 49
Anthers not appendiculated, soft.	
Parasitical plants	MONOTROPEÆ. 51
Leafy, not parasitical plants.	
Ovary three celled.....	POLEMONIACEÆ. 57
Ovary two to five celled, or by abortion one celled.	
Corolla plicate in aestivation	SOLANÆÆ. 60
Corolla imbricated in aestivation.	
Fruit succulent	VACCINACEÆ. 52
Fruit dry, capsular.	
Anthers opening by pores	PYROLACEÆ. 50
Anthers opening by a longitudinal slit.	
Leaves generally opposite and glabrous, corolla regular ..	GENTIANÆÆ. 56
Leaves alternate, decurrent, tomentose, corolla somewhat irregular	VERBACEÆ. 64

2. MONACHLAMYDEOUS PLANTS.

* *Stamens one to six.*

† <i>Perianth petaloid.</i>	
Stamens one to two	ORCHIDÆÆ. 86
Stamens three.....	IRIDÆÆ. 87
Stamens four.	
Perianth scarious, or coloured, with an external involucre resembling a calyx or corolla.	
Stamens four	PLANTAGINÆÆ. 68
Stamens five.	
Styles numerous.....	PLUMBAGINÆÆ. 67
Perianth simple, not involucreted.	
Leaves with a sheath, or interfoliaceous stipule; stamens free; fruit one seeded	POLYGONÆÆ. 71
Leaves without sheaths or stipules.	
Herbs.	
Perianth adnate to the ovary; stamens opposite the segments of the perianth.	
Fruit single seeded	SANTALACEÆ. 74
Fruit many seeded.....	ONAGRARIÆÆ. 30
Shrubs or tree.....	ELEAGNÆÆ. 72

Stamens six.

Carpels combined into a three to six celled ovary.....

Perianth elongated into a strap-shape..... ARISTOLOCHIEÆ. 75

Perianth not elongated into a strap.

Flowers dioecious DIOSCOREÆ. 89

Flowers hermaphrodite.

Perianth adnate to the ovary..... AMARYLLIDÆ. 88

Perianth not adnate to the ovary... LILIACÆ. 90

Carpels more or less separate, at least at the apex.

Anthers dehiscent outwards MELANTHACÆ. 91

Anthers dehiscent internally..... ALISMACEÆ. 94

†† Perianth calycine, or glumaceous.

Shrubs or trees.

Fruit three horned, three celled EUPHORBIACÆ. 77

Fruit neither three horned nor three celled.

Flowers in catkins, or aggregate.

Fruit inclosed in an involucre..... CUPULIFERÆ. 81

Fruit not inclosed in an involucre.

drupaceous MYRICÆ. 82

not drupaceous.

indehiscent, seeds smooth BETULINÆ. 80

two valved, seeds silky..... SALICINÆ. 83

Flowers not in catkins..... ULMACÆ. 79

Herbs or under shrubs.

Limb of the perianth eight to twelve lobed.

Leaves many lobed CERATOPHYLLÆ. 29

Leaves simple LITTEARIEÆ. 28

Limb of the perianth one to six lobed.

Flowers dioecious URTICACÆ. 78

Flowers monocious, or hermaphrodite.

Aquatic plants HALORAGÆ. 31

Not aquatic plants ROSACÆ. 27

Leaves simple, or sometimes pinnatifid.

Stamens one to three

Leaves whorled HALORAGÆ. 31

Leaves not whorled.

Perianth calycine, not glumaceous.

Perianth one or two partite, or none FLUVIALEÆ. 99

Perianth three or six partite.

Capsule five valved PARONYCHIEÆ. 34

Capsules less than five valved.

Stamens one or two.

Capsule three celled, three seeded EUPHORBIACÆ. 77

Capsule not three celled CHENOPODIACÆ. 70

Stamens three.

Leaves ensiform, and subvaginate TYPEACÆ. 98

Leaves neither ensiform nor vaginate.... AMARANTHACÆ. 69

††† Perianth glumaceous; leaves sheathing at the base.

Perianth six partite JUNCÆ. 93

	ORDER
Perianth consisting of one or two valves, or wanting.	
Glumes one valved, proper perianth none; vagina of leave entire; stems generally without knots, and solid	CYPERACEÆ. 102
Glumes generally two valved, pales (perianth) one or two valved; vagina of leaves divided; stem hollow	GRAMINEÆ. 101
Stamens four or five.	
Style one or none.	
Ovaries numerous	FLUVIALEÆ. 99
Ovary single.	
Perianth adhering to the ovary	
Leaves opposite; ovary four celled, many seeded	ONAGRAREÆ. 30
Leaves generally alternate, ovary, one celled, one seeded	SANTALACEÆ. 74
Perianth not adherent.	
Perianth double	PLANTAGINEÆ. 66
Perianth single.	
Fruit dehiscing transversely	AMARANTHACEÆ. 60
Fruit indehiscent.	
Flowers hermaphrodite	CHENOPODIACEÆ. 70
Flowers monœcious or dioecious	URTICACEÆ. 78
Styles two or three.	
Fruit three celled	EUPHORBIACEÆ. 77
Fruit one celled.	
Fruit dehiscing transversely in the middle ..	AMARANTHACEÆ. 60
Fruit indehiscent.	
Leaves sheathing, or with an interfoliaceous membrane at the base	POLYGONÆ. 71
Styles four	CHENOPODIACEÆ. 70
Stamens six.	
Stigma one	ARACEÆ. 97
Stigmas two to six.	
Ovary single.	
Fruit a cariopsis, or one seeded indehiscent capsule	POLYGONÆ. 71
Fruit three or many celled and seeded	JUNCÆ. 93
Ovaries many	ALISMACEÆ. 94
** Stamens seven or more.	
† Ovary single.	
Perianth two to six lobed.	
Shrubs or undershrubs with the anthers dehiscing by a chink	THYMELÆ. 73
Herbs.	
Flowers enclosed in a spathe	HYDROCHARIDÆ. 85
Flowers not in a spathe.	
Fruit a berry	ARALIACEÆ. 39

SYNOPTICAL TABLE.

9

		ORDER
Fruit a capsule.		
Capsule one celled when ripe.		
Style one	THYMELÆÆ.	73
Styles two to three.		
Capsule one seeded.		
Leaves opposite	PARONYCHIÆÆ.	34
Leaves alternate	POLYGONÆÆ.	71
Capsules many seeded	SAXIFRAGACÆÆ.	37
Capsules two to six celled.		
Flowers hermaphrodite	ARISTOLOCHIÆÆ.	75
Flowers unisexual	EUPHORBIACÆÆ.	77
Perianth ten or twelve lobed	CERATOPHYLLÆÆ.	29
†† Ovaries five, or more.		
Leaves with netted veins, generally divided, not sagittate, stamens numerous	RANUNCULACÆÆ.	1
Leaves quite simple, or sagittate, with parallel veins, sta- mens nine.		
Seeds one or two	ALISMACEÆ.	94
Seeds numerous, attached to the sides of the fruit..	BUTOMACEÆ.	95

3. ACHLAMYDEOUS PLANTS.

1. *Floating or submerged Plants.*

Whole plant consisting of a lenticular floating frond, not attached to the ground	PISTIACÆÆ.	100
Plants with stems submersed, and attached to the soil	FLUVIALÆÆ.	90

2. *Plants not floating, rising erect above the surface of the water if aquatic.**Herbs not climbing.*

Plants with milky juice	EUPHORBIACÆÆ.	77
Plants with their juice not milky.		
Flowers with glumaceous scarious scales. (See ).		
Flowers with fleshy or calicoid scales, or naked.		
Flowers in a loose spike	JUNCAGINÆÆ.	93
Flowers collected round a spadix, or in a catkin.		
Stamens short and rigid.		
Inflorescence having a spathe, or bracteated at the base	ARACÆÆ.	97
Inflorescence in heads, surrounded by an invo- lucre	RESTIACÆÆ.	92
Stamens long and weak	TYPHACÆÆ.	96

Shrubs, trees, or climbing herbs.

Leaves entire, toothed, or lobed.		
Ovary pedicellated, three celled, three seeded	EUPHORBIACÆÆ.	77
Ovary sessile, or sub-sessile.		
Fruit succulent.		
Leaves covered with a scaly scurf on the under surface; shrub erect; fruit one celled.	ELEAGINÆÆ.	72
Leaves not scaly beneath; undershrub procumbent, not spinous; fruit many celled	EMPETRÆÆ.	76
Fruit not succulent.		
Stigmas wanting; filaments of the stamens want- ing, or united; leaves needle-shaped, never dentate	CONIFERÆÆ.	84

CRYPTOGAMOUS PLANTS.

Plants with vessels, and monocotyledonous.

ORDER

Plants with leaves or fronds.

Young leaves circinate.

Fructifications on the back of the fronds, or in terminal

spikes FILICES. 103

Fructifications radical..... MARSIACEÆ. 105

Young leaves not circinate LYCOPODIACEÆ. 104

Plants without leaves.

Stem hollow, jointed; branches whorled Equisetaceæ. 106

Stem solid, not jointed LYCOPODIACEÆ. 104

Plants without vessels, and acotyledonous.

MUSCI, 107; HEPATICÆ, 108; LICHENES, 110; FUNGI, 112. . ALGÆ, 111; CHARACEÆ. 109

NATURAL ORDERS

AND

ANALYSIS OF THE GENERA.

1. THALAMIFLORÆ.

Petals distinct, and as well as the stamens hypogynous.

ORDER I. RANUNCULACEÆ.—Juss.

Perianth double. *Calyx* of three to six sepals, sometimes confluent with the petals. *Petals* three to eighteen, imbricated in æstivation, often irregular, rarely wanting. *Stamens* numerous, free, hypogynous. *Anthers* usually turned outwards. *Carpels* numerous, seated on a torus, one celled, or partially united into a single many celled pistil, one or many seeded. *Fruit* either consisting of dry akenia, or berries with more seeds, or follicles, or capsules. *Seeds* with horny albumen. *Embryo* minute, lying in a hollow of the albumen.—*Herbs or undershrubs, the leaves alternate or opposite, generally divided, with the petiole dilated, and forming a sheath, half clasping the stem. Inflorescence variable.*

GENERA.

Petals regular, or calyx and petals not distinguishable.

Carpels capsular, many seeded, de-

hiscent CALTHA, vol. 2. p. 778.

Carpels single seeded, indehiscent.

Leaves opposite..... CLEMATIS, v. 2. p. 781.

Leaves radical, or alternate.

Involute three leaved at some

distance from the flower ... ANEMONE, v. 2. p. 782.

Involute none THALICTRUM, v. 2. p. 779.

Petals regular, numerous; calyx generally green.

Berry or capsule many seeded.

Calyx of four sepals, fruit baccate ... *ACTÆA*, v. 2. p. 758.

Calyx of five sepals, fruit capsular ... *PÆONIA*, v. 2. p. 772.

Carpels indehiscent, single seeded.

Calyx of five sepals, carpels apiculated by a short style.

Petals six to fifteen, with naked claws *ADONIS*, v. 2. p. 785.

Petals five, with tubular filiform claws *MYOSURUS*, v. 1. p. 459.

Petals five, with a small scale at the base of each *RANUNCULUS*, v. 2. p. 786.

Petals irregular, tubular, or spurred at the base.

Calyx petaloid, regular.

Calyx of fifteen sepals *TROLLIUS*, v. 2. p. 777.

Calyx of five to eight sepals.

Petals spurred *AQUILEGIA*, v. 2. p. 775.

Petals not spurred *HELLEBORUS*, v. 2. p. 773.

Calyx petaloid, irregular.

Upper sepals elongated into a spur. ... *DELPHINIUM*, v. 2. p. 769.

Upper sepals concave, and helmet-shaped *ACONITUM*, v. 2. p. 770.

ORDER II. BERBERIDEÆ.—VENT.

Perianth double. *Calyx* of three, four, or six oblong or oval pieces, often somewhat coloured, deciduous, arranged alternately in a double row, surrounded externally by petaloid scales. *Petals* hypogynous, either equal in number to the sepals, and opposite to them, or double the number, generally with a glandular appendage at the base in the inside. *Stamens* as many as the petals, and opposite to them. *Anthers* oblong, two celled, opening elastically with a valve from the base to the apex. *Ovary* (by abortion) solitary, one celled, obliquely ovate. *Style* very short, crowned with a sub-orbicular stigma. *Fruit* a berry or capsule. *Seeds* one to three, attached to the base of the lateral placenta. *Albumen* between fleshy and horny. *Embryo* straight. *Radicle* swollen at the point. *Cotyledons* flat.—*Perennial shrubs or herbs. Leaves alternate, aristato-serrated.*

GENERA.

Shrubs *BERBERIS*, v. 2. p. 461.

Herbs..... *EPIMEDIUM*, v. 1. p. 106.

ORDER III. NYMPHÆACEÆ.—DE CAND.

Perianth double. *Calyx* of four to six oblong pieces, coloured, persistent, gradually passing into *petals*, arranged in numerous rows upon the fleshy disk, which surrounds the pistil. *Stamens* numerous, in many rows, inserved above the petals upon the disk, *filaments* petaloid, flat, *anthers* adnate, linear, two celled, bursting with a longitudinal cleft. *Disk* large, fleshy, more or less surrounding the ovary. *Ovary* numerous, united at the base, free at the apex, radiating upon an urceolate cup. *Fruit* many celled, indehiscent. *Seeds* very numerous, attached to the spongy dissepiments, and enveloped in a gelatinous arillus. *Albumen* farinaceous. *Embryo* small at the base of the albumen, and enclosed in a membranous bag, *cotyledons* foliaceous.—*Aquatic herbs with round horizontal trunks. Leaves peltate, or heart-shaped, fleshy, floating, the petioles elongated. Flowers solitary, radical, with long peduncles.*

GENERA.

Flowers white NYMPHÆA, v. 2. p. 766.

Flowers yellow, petals with a nectariferous opening at the back NUPHAR, v. 2. p. 767.

ORDER IV. PAPAVERACEÆ.—JUSS.

Perianth double. *Calyx* of two concave deciduous foliaceous pieces. *Petals* four, or some multiple of that number, arranged in a single row, and in a cruciate manner. *Stamens* hypogynous, indefinite, in one or many rows, the outer row adherent to the base of the petals. *Filaments* filiform. *Anthers* innate, two celled, opening by a double furrow. *Ovary* free, solitary. *Style* short, or none. *Stigmas* alternate, with the placentas, two or many, radiating upon the flat apex of the ovary. *Fruit* one celled, ovate or oblong, and pod-shaped, with two parietal placenta, or capsular, with several placenta having seeds on both sides, and forming incomplete dissepiments. *Seeds* numerous, sub-globose. *Albumen* between fleshy and oily; *embryo* minute, straight at the base of the albumen. *Cotyledons* plano-convex.—*Herbaceous plants or small shrubs, with milky or coloured juices. Leaves alternate, toothed or lobed. Peduncles elongated, single flowered. Flowers never blue.*

GENERA.

Capsules rounded, or obovate.

Stigmas four to twenty, sessile, radiating on the top of the disk. PAPAVER, vol. 2. p. 747.

Stigmas four to six, free on a short style MECANOPSIS, vol. 2. p. 754.

Capsules elongated.

two celled GLAUCIUM, v. 2. p. 755.

one celled CHELIDONIUM, v. 2. p. 757.

ORDER V. FUMARIACEÆ.—DE CAND.

Perianth double. *Calyx* two small membranous deciduous pieces. *Petals* four, irregular, parallel, the two outer ones alternate with the sepals, and one or both of them saccate at the base, the two inner ones oblong, linear, callous, and coloured at the apex, where they cohere, and enclose the anthers and stigma. *Stamens* six, in two parcels opposite the outer petals. *Anthers* membranous, the outer of each parcel one celled, the central two celled. *Ovary* superior, one celled. *Style* filiform. *Stigma* with two or more points. *Fruit* various, either an indehiscent one or two seeded nut, or a two valved many seeded pod. *Seeds* horizontal, shining, ovato-globose, crested. *Albumen* fleshy. *Embryo* minute. *Cotyledons* oblong.—*Herbaceous plants, with brittle stems and watery juices. Leaves multifid, often with tendrils. Flowers white, purple, or yellow.*

GENERA.

Fruit a compressed, many seeded,

two valved pod CORYDALIS, v. 3. p. 946.

Fruit an indehiscent one seeded

globose nut FUMARIA, v. 3. p. 951.

ORDER VI. CRUCIFERÆ.—JUSS.

Perianth double cruciate. *Calyx* of four pieces, the two inner ones opposite, flat, narrow, the two outer ones broader, concave, gibbous, or rarely spurred at the base. *Stamens* six, two of which are shorter than the others, solitary, opposite the lateral sepals, occasionally toothed, and four are longer, in pairs, opposite the anterior and posterior sepals, mostly distinct, sometimes united, or furnished with a tooth on the inside. *Disk* furnished with callous glands between the petals and the stamens and ovary. *Ovary* superior, solitary, one celled, or with the parietal placentas meeting in the middle, and forming a spurious dissepiment. *Stigmas* two. *Fruit* one or spuriously two celled, elongated (silique) with a short style, or abbreviated (silicle) with a long style, one or many seeded, two valved, dehiscent, rarely without valves, and indehiscent. *Seeds* attached in a single row by a funiculus to each side of the placenta, exalbuminous, oily. *Embryo* with the radical folded upon the cotyledons.—*Herbaceous plants, rarely suffruticose, mostly with alternate leaves, and yellow or white flowers, rarely purple.*

ANALYSIS OF THE SUB-ORDERS, TRIBES, AND GENERA.

SUB-ORDERS.

Fruit a silique (linear pod.)

Silique not jointed SILIQUOSÆ.

Silique separating by transverse articulations LOMENTACEÆ.

Fruit a silicle (roundish or ovate pouch)

Silicle two valved.

Valves broad, convex at the back ... LATISEPTÆ.

Valves narrow, compressed or winged at the back..... ANGUSTISEPTÆ.

Silicle single valved, nut-like NUUMENTACEÆ.

SUB-ORDER 1. SILIQUOSÆ.

Cotyledons accumbent $\bigcirc =$. (The radicle applied to the edges of the lobes). I. ARABIDÆÆ.Cotyledons incumbent $\bigcirc ||$. (The radicle applied to the back of the lobes)... II. SISYMBRÆÆ.Cotyledons conduplicate $\gg$. (The lobes folded lengthwise, the radicle within the lobes..... III. BRASSICÆÆ.

TRIBE 1. ARABIDÆÆ.

Seeds compressed, sometimes marginate.

Calyx with two sacs at the base.

Stigmas converging, thickened or horned at the back..... MATTHIOLA, v. 2 p. 896.

Stigmas spreading, capitate, not thickened or horned at the back... CHEIRANTHUS, v. 2. p. 899.

Calyx equal at the base.

Seeds in a double row in each cell.

Pods short, rounded, valves concave. NASTURTIIUM, v. 2. p. 926.

Pods linear, elongated, valves flat ... TURBITIS, v. 2. p. 905.

Seeds in a single row in each cell.

Flowers yellow BARBAREA, v. 2. p. 901.

Flowers white, purple, or rose coloured.

Pods linear, with flat valves.

Valves with one rib at the back. ARABIS, v. 2. p. 902.

Valves without a rib at the back. CARDAMINE, v. 2. p. 922.

Pods lanceolate..... DENTARIA, v. 2. p. 921.

TRIBE 2. SISYMBRÆÆ.

Calyx with two sacs at the base HESPERIS, v. 2. p. 808.

Calyx equal at the base.

Pod tapering, compressed SISYMBRIUM, v. 2. p. 906.

Pods four angled ERYSIMUM, v. 2. p. 909.

TRIBE 3. BRASSICÆ.

Pods taper.

Valves with a dorsal rib BRASSICA, v. 2. p. 910.

Valves with three to five dorsal ribs ... SINAPIS, v. 2. p. 916.

Pods compressed, linear DIPLTAXIS, v. 2. p. 920.

SUB-ORDER 2. LOMENTACEÆ.

Cotyledons accumbent $\bigcirc =$ I. CAKILINÆ.Cotyledons conduplicate $\bigcirc \gg$ II. RAPHANÆ.

TRIBE 1. CAKILINÆ.

Pods compressed, two jointed..... CAKILE, v. 2. p. 284.

TRIBE 2. RAPHANÆ.

Pods with upper joint globose..... CRAMBE, v. 2. p. 870.

Pods cylindrical, two or more jointed.. ... RAPHANUS, v. 2. p. 928.

SUB-ORDER 3. LATISEPTÆ.

Cotyledons accumbent $\bigcirc =$ I. ALYSSINÆ.Cotyledons incumbent $\bigcirc ||$ II. CAMELINÆ.Cotyledons conduplicate $\bigcirc \gg$ III. VELLÆ.

TRIBE 1. ALYSSINÆ.

Pouch with compressed valves.

Filaments toothed..... ALYSSUM, v. 2. p. 886

Filaments simple.

Seeds one or two in each cell KONIGA, v. 2. p. 885.

Seeds many in each cell DRABA, v. 2. p. 886.

Pouch with convex valves.

Valves with a prominent dorsal rib ... COCHLEARIA, v. 2. p. 890.

Valves without a dorsal rib ARMORACIA, v. 2. p. 892.

TRIBE 2. CAMELINÆ.

Pouch with a lineal prolongation at the end CAMELINA, v. 2. p. 893.

TRIBE 3. VELLÆ.

Pouch with an elongated flat style..... VELLA.

SUB-ORDER 4. ANGUSTISEPTÆ.

Cotyledons accumbent $\bigcirc =$ I. THLASPIDÆ.Cotyledons incumbent $\bigcirc ||$ II. LEPIDINÆ

Cotyledons incumbent, long, linear.

Pouch with many seeded cells..... III. SUBULARIÆ.

Pouch with single seeded cells ... IV. SENEBIERÆ.

TRIBE I. THLASPIDÆ.

Seeds two or more in each cell.

Valves of the pouch winged at the back THLASPI, v. 2. p. 880.

Valves of the pouch not winged at the back.

Pouch elliptical, entire..... HUTCHINSIA, v. 2. p. 888.

Pouch roundish, notched..... TEESDALIA, v. 2. p. 884.

Seeds one in each cell IBERIS, v. 2. p. 884.

TRIBE 2. LEPIDINEÆ.

Pouch roundish, or oblong, cells single

seeded..... LEPIDIUM, v. 2. p. 877.

Pouch triangular, obcordate, cells many

seeded CAPSELLA, v. 2. p. 882.

TRIBE 2. SUBULARIÆ.

Pouch ovate oblong, compressed..... SUBULARIA, v. 2. p. 895.

TRIBE 4. SENEBIERÆ.

Pouch somewhat kidney-shaped, cells

single seeded..... SENEBIERA, v. 2. p. 876.

SUB-ORDER 5. NUCUMENTACEÆ.

Cotyledons incumbent, slightly channeled. ISATIDÆ.

TRIBE I. ISATIDÆ.

Pouch compressed, one celled, one seeded ISATIS, v. 2. p. 875.

ORDER VII. RESEDACEÆ.—DE CAND.

Perianth double. *Calyx* of four to six narrow persistent sepals. *Petals* four to six, alternate, with the sepals unequal, mostly laciniate. *Stamens* ten to twenty-four. *Filaments* variously united at the base, inserted on an irregular shaped glandular disk. *Ovary* sessile, three lobed, one celled, many seeded, with three parietal placentas. *Stigmas* three, glandular, sessile. *Fruit* opening early at the end, dry and membranous, or succulent. *Seeds* sub-pendulous from the placenta in a double row. *Embryo* arcuate, without albumen. *Radical* superior.—*Herbaceous plants, with alternate leaves.*

GENERA.

Fruit dry, many seeded RESEDA, v. 2. p. 678.

ORDER VIII. CISTINEÆ.—DUNAL.

Perianth double. *Oalyx* of five sepals, persistent, unequal, the two outer ones smaller, sometimes wanting, the three inner twisted in aestivation. *Petals* five, very fugitive, twisted in aestivation in a direction contrary to the sepals. *Stamens* numerous, distinct, hypogynous. *Ovary* free, one or many celled. *Style* single, filiform.

Stigma simple. *Fruit* capsular, three to five, rarely ten valved, either one celled, with parietal placentas in the axis of the valves, or imperfectly five or ten celled, with dissepiments, proceeding from the middle valves, and approaching each other in the centre. *Seeds* numerous, small. *Embryo* either spiral, or curved in the midst of mealy albumen.—*Shrubs or herbaceous plants. Leaves simple, mostly alternate, and with or without stipules. Flowers very fugacious, diurnal.*

GENERA.

Capsules with three valves HELIANTHEMUM, v. 2. 759.

ORDER IX. VIOLACEÆ.—LIND.

Perianth double. *Calyx* of five sepals, persistent, imbricated in æstivation, mostly elongated at the base. *Petals* five, hypogynous, equal or unequal, the lower one saccate, or spurred at the base. *Stamens* five. *Anthers* two celled, bursting inwards, either separate or cohering, and lying close upon the ovary. *Filaments* dilated, elongated beyond the anthers into a flat membrane; in the irregular flowers two are generally furnished with an elongated appendage or gland at their base. *Ovary* one celled, with three parietal placentas. *Style* single, with an oblique hooded stigma. *Capsule* of three valves, bearing the placentas in the axis. *Seeds* numerous. *Albumen* fleshy. *Embryo* straight.—*Herbaceous plants or shrubs, mostly with alternate stipulate leaves.*

GENERA.

Anthers combined into a cylinder, the
two lower ones spurred behind. VIOLA, v. 1. p. 314.

ORDER X. DROSERACEÆ.—DE CAND.

Perianth double. *Calyx* of five equal sepals, imbricated in æstivation. *Petals* five, regular. *Stamens* distinct, equal in number with the petals, and alternating with them, or two, three, or four times as many. *Ovary* single. *Styles* three to five, united at the base, or distinct, bifid, or branched. *Capsule* one to three celled, three to five valved, with the placentas either in the middle or at the base. *Seeds* naked, or furnished with an arillus. *Embryo* straight, erect in the axis of a fleshy or cartilaginous albumen.—*Delicate herbaceous plants of marshy grounds. Leaves alternate, mostly furnished with stipulatory cilia.*

GENERA.

Stamens simple..... DROSERA, v. 1. p. 457.

Stamens alternating with fringed glandular tipped scales PARNASSIA, v. 1. p. 446.

ORDER XI. POLYGALÆÆ.

Perianth double. *Sepals* five, the two inner usually petal-like, much larger than the others. *Petals* unequal, three to five, united to the tube of the stamens. *Stamens* monadelphous, separating above into two opposite bundles. *Anthems* one celled, opening by pores at the apex. *Ovary* single, free, mostly two celled, rarely one or three celled. *Style* single, incurved. *Stigma* funnel-shaped, or two lobed. *Fruit* capsular, or drupaceous, one or two celled. *Seeds* pendulous, solitary, usually with an arillus at the base. *Embryo* straight. *Albumen* usually copious and fleshy, occasionally it is wanting, in which case the inner coat of the testa is tumid.—*Herbaceous plants or shrubs. Leaves entire, generally alternate, jointed with the stem. Flowers racemose.*

GENERA.

Capsule compressed, elliptic, seeds pubescent POLYGALA, v. 3. p. 954.

ORDER XII. TAMARISCINÆÆ.—DESV.

Perianth double. *Calyx* four or five partite, imbricated in æstivation, persistent. *Petals* four or five, inserted into the base of the calyx, regular, withering, imbricating in æstivation. *Stamens* equal to or double the number of the petals, the *filaments* being either free or united into a monadelphous tube. *Ovary* free. *Style* short. *Stigmas* three. *Fruit* a three valved one celled many seeded capsule, *placentas* three either at the base of the cavity or along the middle of the valves. *Seeds* erect, or ascending, covered with down at the apex. *Albumen* none. *Embryo* straight. *Radical* small, inferior.—*Shrubs or herbs, with rod-like branches. Leaves alternate, small, scale-like, entire, persistent. Flowers in spikes or racemes.*

GENERA.

Styles three, patent TAMARIX, v. 1. p. 444.

ORDER XIII. FRANKENIACÆÆ.—DE CAND.

Perianth double. *Calyx* of four or five persistent *sepals*, united below into a furrowed tube. *Petals* alternating with the sepals, clawed, and with scales at the base of the limb. *Stamens* hypog-

nous, either equal in number to the petals, and alternating with them, or sometimes with one or two additional, and opposite to the petals. *Filaments* filiform. *Anthers* roundish, versatile. *Ovary* single, free, superior. *Style* filiform, two or three-cleft. *Capsule* one celled, two to four valved, surmounted with the persistent calyx. *Seeds* small, attached to the margin of the valves. *Embryo* straight, erect in the middle of the albumen. — *Herbs or undershrubs. Leaves opposite, or whorled, without stipules, but expanded at the base into an amplexicaul membrane. Stem much branched, bearing sessile flowers in the divisions of the branches.*

GENERA.

Style trifiid..... FRANKENIA, v. 2. p. 463.

ORDER XIV. ELATINÆ — CAMBES.

Perianth double. *Calyx* of three to five distinct or slightly united sepals. *Petals* three to five. *Stamens* free, hypogynous, as many or double the number of the petals. *Ovary* with three to five cells. *Styles* distinct. *Stigmas* capitate. *Fruit* a three to five celled capsule, with central placenta. *Seeds* numerous, small, cylindrical, with a straight *embryo* in the axis of a small quantity of albumen. — *Small annual plants, found in marshy places, with slender hollow stems and opposite leaves, without stipules.*

GENERA.

Stamens three to four, or six to eight... ELATINE, v. 2. p. 581.

ORDER XV. CARYOPHYLLÆ.—JUSS.

Perianth double. *Calyx* of four or five sepals, distinct, or united into a tube, persistent. *Petals* four or five, hypogynous, clawed, inserted upon the pedicle of the ovary, sometimes wanting, and occasionally crowned with scales at the top of the claw. *Stamens* as many or double the number of the petals, inserted upon the pedicle of the ovary. *Filaments* subulate, sometimes united at the base. *Anthers* two celled. *Ovary* single, mostly elevated on a pedicle. *Stigmas* sessile, three to five, filiform. *Fruit* a capsule, of one or two to five cells, two to five valved, bursting at the apex. *Placenta* central. *Seeds* mostly numerous. *Albumen* mealy. *Embryo* curved, round the albumen, or straight. *Radical* directed towards the hilum. — *Herbaceous plants, rarely undershrubs. Stem swollen at the joints. Leaves opposite, often united at the base.*

GENERA.

TRIBE 1. SILENEÆ.

Sepals united into a cylindrical tube. Capsules stalked.

Styles two.

Calyx with bractea at the base DIANTHUS, v. 2. p. 616.

Calyx naked at the base SAPONARIA, v. 2. p. 621.

Styles three SILENE, v. 2. p. 622.

Styles five.

Calyx teeth simple LYCHNIS, v. 2. p. 671.

Calyx teeth foliaceous AGROSTEMMA, v. 2. p. 670.

TRIBE 2. ALSINEÆ.

*Sepals distinct, or slightly united at the base. Capsules sessile.*Capsules opening with distinct valves, the
same number as the styles.

Styles two BUFFONIA, v. 1. p. 204.

Styles four SAGINA, v. 1. p. 217.

Styles five SPERGULA, v. 2. p. 655.

Styles three.

Filaments all subulate..... .. ALSINE, v. 2. p. 631.

Outer filaments rising from a notched
glandular base CHERLERIA, v. 2. p. 637.Capsules opening at the apex, with teeth
double the number of the styles

Styles three.

Petals entire..... .. ARENARIA, v. 2. p. 638.

Petals toothed HOLOSTEUM, v. 1. p. 172.

Petals bifid, or bipartite STELLARIA, v. 2. p. 640.

Styles four..... .. MOENCHIA, v. 1. p. 218.

Styles five.

Capsule with five bifid teeth MALACHIUM, v. 2. p. 648.

Capsule with ten equal teeth CERASTIUM, v. 2. p. 649.

Capsules opening with distinct valves,
double the number of the

styles MOEBINGIA, v. 2. p. 639.

ORDER XVI. MALVACEÆ.—Juss.

Perianth double. *Calyx* of five equal sepals, rarely three or four, more or less united at the base, often double, the outer ones forming a kind of involucre, valvate in æstivation. *Petals* as many as the sepals, and alternating with them, hypogynous, equal, spiral in æstivation, either distinct or adhering to the tube of the stamens. *Stamens* indefinite, (rarely indefinite), hypogynous. *Filaments* united into a tube. *Anthers* one celled, reniform, bursting transversely. *Ovary*

formed by the union of many carpels round a common axis. *Styles* the same number as the carpels, distinct or united. *Stigmas* variable. *Fruit* mostly capsular, rarely baccate, its carpels being either one or many seeded, sometimes united into one, sometimes separate or separable. *Seeds* sometimes hairy. *Albumen* little or none. *Embryo* curved. *Cotyledons* twisted.—*Herbaceous plants, trees, or shrubs. Leaves* alternate, mostly petiolate, and with stipules. *Hairs* stellate.

GENERA.

Outer calyx or involucre three leaved ... MALVA, v. 3. p. 944.

Outer calyx or involucre six to nine cleft ALTHÆA, v. 3. p. 946.

Outer calyx or involucre three lobed LAVATERA, v. 3. p. 943.

ORDER XVII. TILIACEÆ.—JUSS.

Perianth double. *Calyx* of four or five sepals, valvate in æstivation. *Petals* four or five, alternate, with the sepals entire. *Stamens* hypogynous, distinct, generally indefinite in numbers. *Anthers* two celled, bursting longitudinally. *Glands* equal in number to the petals, and opposite to them adhering to the stalk of the ovary. *Ovary* single, composed of from four to ten carpels, united together. *Style* single. *Stigmas* as numerous as the carpels. *Fruit* dry, of several cells. *Seeds* numerous. *Embryo* straight in the axis of fleshy albumen. *Cotyledons* flat, foliaceous.—*Trees or shrubs, with simple toothed stipulate leaves.*

GENERA.

Ovary five-celled, villous..... TILIA, v. 2. p. 763.

ORDER XVIII. HYPERICINEÆ.—DE CAND.

Perianth double. *Calyx* of four or five persistent sepals, distinct, or more or less united, imbricated, furnished with glandular dots. *Petals* four or five, hypogynous, twisted in æstivation. *Stamens* indefinite, hypogynous, connected in three or four bundles at the base. *Anthers* oscillating. *Ovary* single, superior, free. *Styles* several, rarely united. *Stigmas* simple. *Fruit* a capsule or berry, of many valves and many cells, the inner edges of the valves being curled inwards. *Seeds* minute, numerous, attached to a central placenta, or the marginal ones of the valves. *Embryo* straight. *Radical inferior. Albumen* wanting.—*Herbaceous plants, shrubs, or trees, with a resinous juice. Leaves* opposite, dotted with glands, or punctate. *Flowers* usually yellow.

GENERA.

Fruit a pulpy berry ANDROSCÆMUM, v. 3. p. 1010.

Fruit a dry membranous capsule..... HYPERICUM, v. 3. p. 1011.

ORDER XIX. ACERINEÆ.—JUSS.

Perianth double. *Calyx* five, rarely four to nine partite, imbricated. *Petals* the same number as the calyx lobe, and inserted round an hypogynous disk. *Stamens* generally eight, inserted upon the hypogynous disk. *Anthers* oblong. *Ovary* two lobed. *Style* single. *Stigmas* two. *Fruit* consisting of two indehiscent carpels, which separate when ripe, each carpel one celled, one to two seeded, compressed in the upper part, and terminating in a diverging membranous wing, thickened at the lower part. *Seeds* oblong, attached to the base of the cell. *Embryo* curved, with foliaceous wrinkled cotyledons, and an inferior radical. *Albumen* none.—*Trees with opposite simple leaves.*

GENERA.

Flowers polygamous, calyx five parted. ACER, v. 2. p. 540.

ORDER XX. GERANIACEÆ.—JUSS.

Perianth double. *Calyx* of five persistent sepals, more or less unequal, imbricated in æstivation, one sepal sometimes saccate, or spurred at the base. *Petals* generally five clawed, equal or unequal, either hypogynous or perigynous. *Stamens* usually monadelphous, hypogynous, or perigynous, two or three times as many as the petals, sometimes abortive. *Ovary* composed of five cells, round on an elongated axis. *Styles* five, long, cohering round the axis. *Fruit* formed of five carpels, sub-membranous, cohering round the lengthened indurated style, which curls up in various modes, and draws up the carpel out of the calyx. *Seed* solitary, pendulous, without albumen. *Embryo* curved. *Radical* pointing towards the base of the carpel. *Cotyledons* foliaceous, convolute, and plaited.—*Herbaceous plants or shrubs. Leaves either opposite or alternate, when alternate the peduncles are opposite.*

GENERA.

Stamens ten, all perfect GERANIUM, v. 3. p. 933.

Stamens ten, five perfect, five barren... ERODIUM, v. 3. p. 931.

ORDER XXI. LINEÆ.—DE CAND.

Perianth double. *Calyx* of three to five sepals, persistent, imbricated in æstivation. *Petals* three to five, hypogynous, clawed, with a

twisted aestivation. *Stamens* equal in number, and alternate, with the petals united at the base into a hypogynous ring, with a tooth (an abortive filament) between each. *Anthers* ovate, innate, two celled. *Ovary* with about the same number of cells as there are sepals. *Styles* equal in number with the cells. *Stigmas* capitate. *Fruit* a globose capsule, pointed with the indurated base of the styles, many celled, each cell partially divided in two by an imperfect dissepiment, and dehiscing with two valves at the apex. *Seed* solitary in each cell, compressed, inserted. *Albumen* usually absent, but the inner lining of the testa is tumid. *Embryo* straight, with the radical pointing towards the hilum. *Cotyledons* flat.—*Herbaceous plants or small shrubs, with entire leaves, without stipules.*

GENERA.

Petals five, capsules ten celled..... LINUM, v. 1, p. 452.

Petals four, capsules eight celled..... RADIOLA, v. 1. p. 219.

ORDER XXII. BALSAMINEÆ.—A. RICHARD.

Perianth double. *Calyx* of two deciduous sepals, with an imbricated aestivation. *Petals* four, irregular, hypogynous, the two outer ones alternate with the sepals, and callous at the apex, the upper one arched, emarginate, the lower entire, prolonged at the base into a spur. *Stamens* five, hypogynous, the three lower standing opposite the petals, and bearing anthers, with two perfect cells, the two upper placed in front of the upper petal, with anthers one or two celled. *Filaments* thickened at the apex. *Anthers* partly connate, bursting lengthwise. *Ovary* single. *Stigmas* five, sessile, distinct or united. *Fruit* a membranous capsule, five celled, five to ten valved, bursting elastically. *Placenta* central, five angled, the angles connected with the suture of the valves by thin membranous partitions. *Seeds* numerous, pendulous, without *albumen*. *Embryo* straight. *Radical* superior. *Cotyledons* plano-convex.—*Succulent herbaceous plants. Leaves simple, without stipules. Flowers axillary.*

GENERA.

Stigmas united IMPATIENS, v. i. p. 313.

ORDER XXIII. OXALIDEÆ.—DE CAND.

Perianth double, *Sepals* five, equal, persistent, imbricated in aestivation. *Petals* five, hypogynous, equal clawed, with a spirally twisted aestivation. *Stamens* ten, the filaments more or less united at the base, those opposite the petals forming an inner series, and longer than the others. *Anthers* two celled, innate. *Ovary* free, of five

cells. *Styles* five, filiform. *Stigmas* capitate, or somewhat bifid. *Fruit* a five celled membranous capsule, five to ten celled, bursting longitudinally. *Seeds* few, attached to the axis, while young enclosed in a fleshy arillus, which curls back when the fruit is ripe, and expels the seed with an elastic force. *Albumen* between cartilaginous and fleshy. *Embryo* inverted, with a long superior radical. *Cotyledons* foliaceous.—*Herbaceous plants or undershrubs, with alternate leaves, mostly compound.*

GENERA.

Herbaceous perennial plants OXALIS, v. 2. p. 658.

2. CALYCIFLORÆ.

Petals distinct. Stamens perigynous.

ORDER XXIV. CELASTRINÆ.—BROWN.

Perianth double. *Calyx* of four or five sepals, cohering at the base imbricated in æstivation. *Petals* four or five, inserted into the margin of a hypogynous disk. *Stamens* alternate, with the petals inserted into the disk. *Ovary* free, surrounded by a fleshy disk, two to four celled, cells one or many seeded. *Style* one or wanting. *Stigmas* two to four-cleft. *Fruit* capsular, baccate, drupaceous, or samaroidous, various in form, and often deformed by the abortion of the cells. *Seeds* erect, rarely pendulous, often with an arillus. *Albumen* none, or fleshy. *Embryo* straight in the axis of the seed — *Shrubs or trees, often with stipulated alternate or opposite leaves.*

GENERA.

Leaves pinnate STAPHYLEA, v. 1. p. 443
 Leaves simple EUONYMUS, v. 1, p. 311.

ORDER XXV. RHAMNÆ.—JUSS.

Perianth double. *Calyx* four or five-cleft, tubular, adherent to the ovary, valvate in æstivation. *Petals* as many as and alternate with the lobes of the calyx, often scale-like, inserted into the mouth of the calyx. *Stamens* as many as the petals, and opposite to them. *Anthers* two celled. *Ovary* either entirely or partially united to the calyx, two to four celled, surrounded by a glandular disk. *Style* one. *Stigmas* two to four. *Fruit* fleshy, indehiscent, or dry, rarely capsular. *Seeds* erect, solitary. *Albumen* fleshy, seldom wanting. *Embryo* straight in the axis of the seed. *Radicle* short, inferior.

Cotyledons large, flat.—*Shrubs* or *small trees*, *leaves simple*, *opposite* rarely *alternate*, with *stipules*.

GENERA.

Fruit fleshy, two to four celled RHAMNUS, v. 1. p. 308.

ORDER XXVI. LEGUMINOSÆ.—JUSS.

PAPILIONACEÆ.—LINN.

Perianth double. *Calyx* of five sepals, more or less combined often unequal, the odd segment anterior. *Petals* five, or by abortion four, three, two, one, or none, inserted into the base of the calyx, either papilionaceous, or regularly spreading, the odd petal posterior. *Stamens* inserted with the petals, generally double their number, (rarely three or four times their number, or fewer,) perigynous, either distinct or variously united, being either monadelphous, with the tube entire or cleft above, or diadelphous, nine, and one or five and five, very rarely triadelphous. *Anthers* two celled, versatile. *Ovary* simple, superior, one celled, one or many seeded. *Style* single, rising from the upper suture. *Stigmas* simple, terminal or lateral. *Fruit* a two valved legume, one celled, or longitudinally two celled, or by transverse membranes or articulations many celled. *Seeds* solitary, or several on the upper suture, inserted alternately into each valve, occasionally with an arillus. *Embryo* destitute of *albumen*, either straight or with the radicle bent upon the cotyledons. *Cotyledons* either foliaceous or fleshy, during germination the former are elevated above the ground, the latter always remain under.—*Shrubs*, *trees*, or *herbaceous plants*, with *alternate bi-stipulated simple* or *variously compound petiolated leaves*.

GENERA.

TRIBE 1. LOTEÆ. DE CAND. *Pods* continuous. *Cotyledons* in *germination*, rising above the ground, and becoming green *leaves*.

Stamens monadelphous.

Calyx two lipped.

upper lip three toothed, lower two

toothed ULEX, v. 8. p. 955.

upper lip two toothed, lower three

toothed GENISTA, v. 3. p. 957.

upper lip entire, lower three toothed ... CYTISUS, v. 3. p. 959.

Calyx with equal teeth.

five toothed, inflated..... ANTHYLLIS, v. 3. p. 963.

five-cleft ONONIS, v. 3. p. 961.

Stamens diadelphous.

Pods one celled.

few seeded, scarcely longer than the calyx.

calyx five toothed. Flowers racemose MELILOTUS, v. 3. p. 968.

calyx five-cleft. Flowers capitate, or spiked..... TRIFOLIUM, v. 3. p. 970.

many seeded, much longer than the calyx.

straight.

keel long, with a narrowed beak. LOTUS, v. 3. p. 983.

keel very short TRIGONELLA, v. 3. 982.

falcate, or spiral MEDICAGO, v. 3. p. 986.

Pods imperfectly two celled.

keel with a narrow straight point ... OXYTROPIS, v. 3. p. 966.

keel obtuse..... ASTRAGALUS, v. 3. p. 964.

TRIBE 2. VICIEÆ.—DE CAND

Pods continuous. Cotyledons in germination, remaining under ground, and not becoming green leaves.

Style at right angles with the ovary, villous

on both sides..... VICIA, v. 3. p. 994.

Style curved, compressed, dilated at the end, villous in front.

Calyx of five foliaceous segments LATHYRUS, v. 3. p. 1003.

Calyx campanulate PISUM, v. 3. p. 1002.

Style curved, slender, not dilated, villous

at the end OROBUS, v. 3. p. 1007.

TRIBE 3. HEDYSARÆÆ.—DE CAND.

Pods divided internally by transverse articulations into one seeded joints.

Pod with several joints.

elongated, compressed.

joints equally narrowed on both sides ORNITHOPUS, v. 3. p. 992.

joints straight on the outer edge,

curved into a crescent shape on

the inner edge HIPPOCREPIS, v. 3. p. 993.

elongated, cylindrical ASTROLOBIUM, v. 3. p. 992.

Pot with one joint only..... ONOBRYCHIS, v. 3. p. 990.

ORDER XXVII. ROSACEÆ.—JUSS.

Perianth double. Calyx four or five lobed, tubular, with a disk lining the tube, or surrounding the orifice. Petals usually as many as the calyx lobes, and alternating with them, equal. Stamens in-

definite, inserted with the petals into the calyx. *Filaments* incurved in æstivation. *Anthers* two celled, bursting lengthwise. *Carpels* numerous, sometimes by abortion solitary, sometimes having the appearance of a single ovary from their union either together or with the tube of the calyx. *Ovary* one celled. *Styles* simple, mostly arising from the side of the ovary. *Fruit* either one seeded nuts or small drupes, or pomes or follicles containing several seeds. *Seeds* mostly one to two, erect, or suspended. *Embryo* straight, without, or with very little, *albumen*, and the *cotyledons* fleshy or foliaceous.—*Herbaceous plants, shrubs, or trees. Leaves simple, or compound, alternate, with two stipules at their base.*

TRIBES

Corolla polypetalous.

Fruit a solitary one or two seeded drupe 1. AMYGDALÆÆ.

Fruit a one to five celled pome 2. POMACÆÆ.

Fruit baccate, composed of many nuts,
surrounded by the fleshy calyx. 3. ROSACÆÆ.

Fruit numerous small nuts, inserted
upon a dry or fleshy receptacle. 4. DRYADÆÆ.

Fruit formed of several one to six seeded
follicles, spirally twisted 5. SPIRÆACÆÆ.

Corolla monopetalous, or wanting 6. SANGUISORBÆÆ.

TRIBE 1. AMYGDALÆÆ.—DE CAND

Drupe covered with bloom, stone compressed PRUNUS, v. 2. p. 682.

Drupe not covered with bloom, stone round CERASUS, v. 2. p. 684.

TRIBE 2.—POMACÆÆ.—DE CAND.

Calyx segments foliaceous MESPILUS, v. 2. p. 687.

Calyx segments not foliaceous.

Fruit open at the apex..... COTONEASTER, v. 2. p. 690.

Fruit closed at the apex.

Carpella hard, bony CRATÆGUS, v. 2. p. 688.

Carpella cartilaginous PYRUS, v. 2. p. 691.

TRIBE 3 —ROSACÆÆ.—DE CAND.

Fruit consisting of numerous dry nuts,
enclosed in the fleshy tube of the
calyx, contracted at its orifice ROSA, v. 2. p. 699.

TRIBE 4. DRYADÆÆ.—VENT.

Carpella numerous, on succulent receptacles.

Calyx four or five-cleft, naked RUBUS, v. 2. p. 719.

Calyx four or five-cleft, bracteated FRAGARIA, v. 2. p. 725.

Carpella numerous, on dry receptacles.

Calyx eight to nine partite DRYAS, v. 2. p. 732.

Calyx four or five-cleft, bracteated.

Styles long, persistent, jointed..... GEUM, v. 2. p. 733.

Styles deciduous, not jointed.

receptacle large, spongy COMARUM, v. 2. p. 737.

receptacle small, hard.

Stamens and carpella numerous. POTENTILLA, v. 2. p. 738

Stamens and carpella generally

five SIBBALDIA, v. 1. p. 456.

Carpella two, enclosed in the indurated

tube of the calyx AGRIMONIA, v. 2. p. 676.

TRIBE 5. SPIRÆACEÆ.—DE CAND.

Seeds two to six, exalbuminous SPIRÆA, v. 2. p. 697.

TRIBE 6.—SANGUISORBÆÆ.—JUSS.

Perianth eight parted ALCHEMILLA, v. 1. p. 201.

Perianth four parted..... SANGUISORBA, v. 1. p. 203.

Perianth four-cleft, tubular POTERIUM, v. 3. p.

ORDER XXVIII. LYTHRARIÆÆ.—JUSS.

Perianth double. *Calyx* tubular, or campanulate, lobed, the lobes valvate, or distant in æstivation, their sinuses sometimes lengthened into other lobes. *Petals* inserted on the upper part of the tube of the calyx between the lobes, fugacious. *Stamens* inserted into the tube of the calyx before the petals, to which they are sometimes equal in number, or two, three, and sometimes four times as numerous. *Anthers* two celled, versatile. *Ovary* superior, two or four celled. *Style* filiform. *Stigma* mostly capitate. *Fruit* a membranous capsule, covered by the calyx, one celled, dehiscing either longitudinally or in an irregular manner. *Seeds* numerous, small, without *albumen*, attached to a central *placenta*, *embryo* straight, *radicle* turned towards the hilum, *cotyledons* flat, foliaceous.—*Herbaceous plants with opposite rarely alternate simple exstipulate leaves.*

GENERA.

Calyx campanulate, six to twelve toothed;

petals shorter than the calyx PEPLIS, v. 2. p. 464.

Calyx cylindrical, striated, eight to twelve

toothed; petals longer than the calyx LYTHEUM, v. 2. p. 675.

ORDER XXIX. CERATOPHYLLÆÆ.—GRAY.

Flowers monœcious. *Perianth* single, tubular, free, many partite, the lobes equal. *Barren* flowers with twelve to twenty *stamens*, with

out filaments. *Anthers* two celled, ovate oblong, crowded in the centre of the calyx. *Fertile flowers* with a one celled superior ovary. *Style* filiform, curved. *Stigma* simple. *Fruit* a one celled single seeded indehiscent nut, crowned by the hardened style. *Seed* pendulous. *Albumen* wanting. *Embryo* straight. *Radicle* superior. *Cotyledons* four, whorled, the two broadest opposite.—*Aquatic herbs with much divided whorled leaves.*

GENERA.

Fruit sessile in the axis of the leaves ... CERATOPHYLLUM, v. 3. p. 1201.

ORDER XXX. ONAGRARIÆ.—JUSS

Perianth double. *Calyx* superior, tubular, with a four or five lobed limb, with a valvate æstivation. *Petals* regular, mostly equal in number to the lobes of the calyx, into the throat of which they are inserted, twisted in æstivation. *Stamens* two, four, or eight, inserted into the calyx. *Filaments* free. *Anthers* ovate oblong. *Style* single, filiform. *Stigma* capitate, or four lobed. *Ovary* many celled, often crowned by a glandular disk. *Fruit* capsular, baccate, or drupaceous, two to four celled. *Seeds* numerous (rarely solitary) in each cell, fixed to the central angle. *Albumen* wanting. *Embryo* straight. *Radicle* long and tapering. *Cotyledons* very short.—*Herbaceous plants or shrubs. Leaves alternate or opposite, simple, entire, or toothed.*

GENERA.

Stamens two CIRCEA, v. 1. p. 25.
 Stamens four..... ISNARDIA, v. 1. p. 202.
 Stamens eight.
 Seeds bearded EPILOBIUM, v. 2. p. 543.
 Seeds not bearded..... OENOTHERA, v. 2. p. 551.

ORDER XXXI. HALORAGÆ.—BROWN.

Perianth double. *Calyx* superior, adhering to the ovary in its whole length, the limb very minute. *Petals* inserted into the summit of the calyx, very minute, or wanting. *Stamens* inserted with the petals, and equal to them in number, or occasionally fewer. *Ovary* adhering inseparably to the calyx, one or more celled. *Stigmas* sessile, equal in number to the cells. *Fruit* dry, membranous, or nut-like, indehiscent, more or less concreted within the calyx. *Seed* solitary, pendulous in each cell. *Albumen* fleshy. *Embryo* central straight. *Radicle* superior. *Cotyledons* two, short.—*Herbaceous plants or undershrubs. The European species are all aquatic herbs,*

with axillary spiked flowers, sometimes monœcious, or by abortion dioecious.

GENERA.

- Petals four..... MYROPHYLLDUM, v. 3. p. 3.
 Petals wanting.
 Leaves whorled..... HIPURIS, v. 1. p. 3.
 Leaves not whorled CALLITRICHÆ, v. 3. p. 1144.

ORDER XXXII. CUCURBITACEÆ.—Juss.

Perianth double. *Flowers* complete, or incomplete. *Calyx* five toothed. *Corolla* five parted, often scarcely distinguished from the calyx, very cellular, and marked with distinct netted veins. *Stamens* five, either distinct or more or less united. *Anthers* two celled, very long, flexuous. *Ovary* inferior, one celled, with three parietal placentas. *Style* short. *Stigmas* three to five, thick, velvety, bilobed. *Fruit* fleshy, more or less succulent, crowned by the scar of the calyx, one celled. *Seeds* flat, ovate, attached to the parietes of the fruit, enveloped in juicy or dry membranous arillus; *testa* coriaceous, often thick at the margin. *Embryo* flat. *Albumen* wanting. *Cotyledons* foliaceous, veined. *Radicle* next the hilum.—*Roots* annual or perennial, fibrous or tuberous. *Stem* climbing, herbaceous or shrubby. *Leaves* palmated, often covered with short rough hairs, tendrils formed by abortive leaves. *Flowers* solitary, panicled or fasciculated.

GENERA.

- Flowers diceous, fruit a small berry ... BRYONIA, v. 3. p. 1198.

ORDER XXXIII. PORTULACÆÆ.—Juss.

Perianth double. *Calyx* of two, seldom three or five, sepals, cohering at the base. *Petals* usually five, either distinct or cohering at the base into a short tube. *Stamens* variable in number, inserted with the petals into the base of the calyx, and if equal to them in number opposite to them. *Filaments* distinct. *Anthers* versatile, two celled, opening lengthwise. *Ovary* superior, one celled. *Style* single, or none. *Stigma* several, much divided. *Fruit* a one celled capsule, bursting transversely or by three valves from the apex to the base. *Seeds* numerous, attached to a central placenta. *Albumen* farinaceous. *Embryo* curving the albumen. *Radicle* long, cylindrical.—*Succulent herbs or shrubs, with entire exstipulate leaves and axillary or terminal flowers.*

GENERA.

- Stamens three. Corolla unequal MONTIA, v. 1. p. 71.

ORDER XXXIV. PARONYCHIEÆ.—ST. HIL.

Perianth double, rarely single. *Calyx* of five, rarely three or four, sepals, more or less united, imbricated in æstivation. *Petals* small, scale-like, often resembling abortive stamens, generally as numerous as the sepals, and inserted into the tube between. *Stamens* inserted into the tube of the calyx opposite to the lobes, and equalling them in number, or rarely by abortion fewer. *Filaments* distinct. *Anthers* two celled. *Ovary* free. *Styles* two or three, distinct, or more or less united. *Fruit* small, dry, generally membranous, three valved, or indehiscent. *Placenta* central. *Seeds* numerous, or solitary, suspended by a long cord, which arises from the bottom of the cell. *Albumen* farinaceous. *Embryo* cylindrical, lateral, curved or surrounding the albumen. *Radicle* turned towards the hilum.—*Branching herbs or shrubs, leaves generally opposite, with or without stipules. Flowers sessile, small.*

GENERA.

Stamens five.

Stigmas three..... CORRIGDOLA, v. 1. p. 445.

Stigmas two, sepals simple HERNIARIA, v. 1. p. 430.

Stigmas two, sepals horned at the back ILLECEBRUM, v. 1. p. 333.
Stamens three to five.

Petals emarginate..... POLYCARPON, v. 1. p. 173.

Stamens ten, rarely five.

Petals wanting:..... SCLERANTHUS, v. 2. p. 595.

ORDER XXXV. CRASSULACEÆ.—DE CAND.

Perianth double. *Calyx* from three to twenty sepals, more or less united at the base. *Petals* the same number as the sepals, and alternating with them, regular, free, or united into a monopetalous corolla, inserted into the calyx. *Stamens* inserted with the petals, either equal in number to, and alternate with them, or double their number, those opposite the petals are shortest, and are longer coming to perfection than the others. *Filaments* distinct, subulate. *Anthers* oval, two celled, bursting lengthwise. *Ovaries* of the same number as the petals, opposite to which they are placed around an imaginary axis, distinct, one celled, opening by a longitudinal chink along the inner angle, each mostly having at its base a glandular scale. *Seeds* fixed in a double row to the inner angle of the carpels. *Albumen* thin, fleshy. *Embryo* straight. *Radicle* directed towards the hilum.—*Succulent herbs or shrubs, with fleshy generally alternate leaves. Flowers usually in cymes.*

GENERA.

Stamens three or four TILLEA, v. 1. p. 218.

Stamens eight to twelve.

Corolla monopetalous.

Corolla polypetalous.

nectariferous scales entire SEDUM, v. 2. p. 661.

nectariferous scales emarginated or
lacerated.. SEMPERVIVUM, v. 2 p. 681.

ORDER XXXVI. GROSSULACEÆ.—MIRR.

Perianth double. *Calyx* superior, four or five-cleft, regular, coloured. *Petals* four or five, inserted with the stamens at the mouth of the tube, and alternating with them. *Stamens* five. *Anthers* two celled, bursting longitudinally. *Ovary* one celled, with two opposite parietal placentas. *Style* single, two to four-cleft. *Fruit* a sub-globose one celled many seeded berry, crowned with the persistent calyx. *Seeds* numerous, suspended by long filiform cords among the pulp, outer integuments gelatinous or membranaceous; inner one a thin membrane, closely adherent to the albumen. *Albumen* horny. *Embryo* minute, straight, placed in the narrow extremity of the seed. *Radicle* obtuse.—*Shrubs* either unarmed or spiny. *Leaves* alternate, lobed, or cut. *Flowers* in axillary racemes bracteated at their base

GENERA.

Calyx five-cleft RIBES, v. 1. p. 324.

Perianth double. *Calyx* of four or five sepals, more or less united at their base, either superior or inferior. *Petals* four or five, inserted into the calyx, and alternating with the lobes, deciduous, or persistent, rarely wanting. *Stamens* inserted on the calyx, either equal in number to the petals, and alternating with them, or double their number, five being opposite and five alternating with them. *Filaments* subulate. *Anthers* ovate, two celled. *Ovaries* composed of two carpels (rarely more), more or less united at their faces. *Stigma* sessile on the apex of the carpels. *Fruit* one or two celled, membranous, bursting between the styles, or from the base to the apex. *Seeds* small, generally numerous, very minute. *Embryo* taper in the axis of fleshy albumen. *Radicle* inferior. *Cotyledons* short, ovate.—*Herbaceous plants* or *shrubs*. *Leaves* simple, either entire or divided, alternate, exstipulate. *Flower stem* simple, often naked.

GENERA.

Petals five SAXIFRAGA, v. 2. p. 598.

Petals wanting CHEYSOPLENUM, v. 2. 597

ORDER XXXVIII. UMBELLIFERÆ.—Juss.

Ferianth double. *Calyx* superior, limb five toothed, entire, or obsolete. *Petals* five, inserted into the upper part of the calyx, usually with an inflexed point, valvate, or imbricated in æstivation. *Stamens* five, alternating with the petals, incurved in æstivation. *Ovary* inferior, two celled, each with a solitary pendulous ovula, crowned by a double fleshy disk. *Styles* two, distinct. *Stigmata* simple. *Fruit* consisting of two carpels, more or less united together, by their face (commisure) to a common axis (columnella), from which they ultimately separate, and become pendulous; each carpel is more or less distinctly marked with five dorsal ridges, called primary, and four alternating with them secondary, the ridges are separated by channels, beneath which are often placed in the substance of the testa canals, *vittæ* containing coloured oily matter. *Seed* solitary, pendulous, usually adhering inseparably to the pericarpium. *Albumen* abundant, hairy. *Embryo* minute at the base of the albumen. *Radicle* pointing to the hilum.—*Herbaceous plants, with fistular stems. Lerves generally much divided, sheathing at the base. Flowers umbellate, rarely capitate, generally surrounded by an involucreum.*

SUB-ORDERS.

- Seed or albumen flat, not furrowed in front* ORTHOSPERMÆ.
Seed or albumen, inflexed at the margin,
or deeply furrowed in front CAMPYLOSPERMÆ
Seed or albumen hemispherical, concave in
front CÆLOSPERMÆ.

TRIBES.

SUB-ORDER 1. ORTHOSPERMÆ.

Umbel imperfect, or simple.

- Fruit laterally compressed, its back even*
or acute 1. HYDROCOTYLÆÆ.
Fruit on a transverse section, nearly
round 2. SANICULÆÆ.

Umbel perfect, or compound.

- Carpels with primary ridges only.*
Fruit laterally compressed, or didymous 3. AMMINEÆ.
Fruit on a transverse section, nearly
round 4. SESKLINEÆ.
margins dilated, with double wings 5. ANGELICEÆ.
margins dilated, with a single wing,
flat, or thickened towards the
edge 6. PEUCEDANÆÆ.
Carpels with primary and secondary
ridges.

Fruit with the secondary ridges rows
of prickles 7. DAUCINEÆ.

SUB-ORDER 2. CAMPYLOSPERMÆ.

Carpels with primary and secondary
ridges.
secondary ridges most prominent,
prickly..... 8. CAUCALINEÆ.

Carpels with primary ridges only.
Fruit compressed, or contracted on
the sides, often beaked..... 9. SCANDICINEÆ.

Fruit turgid, slightly compressed, or
contracted on the sides, not
beaked 10. SMYRNEÆ.

SUB-ORDER 3. CÆLOSPERMÆ.

Fruit globose, or didymous 11. CORIANDREÆ.

GENERA.

TRIBE 1. HYDROCOTYLEÆ.

Calyx margin obsolete HYDROCOTYLE, v. 1. p. 347

TRIBE 2. SANICULEÆ.

Fruit sub globose, covered with hooked
spines..... SANICULA, v. 1. p. 349.

Fruit obovate, covered with chaffy scales. ERYNGIUM, v. 1. p. 350.

TRIBE 3. AMMINÆ.

Leaves simple BUPLEURUM, v. 1. p. 352.

Leaves compound.

Petals entire, with a small incurved
point.

calyx limb obsolete.

channels with vittæ.

umbels with involucre PTEROSELINUM, v. 1. p. 356

channels without vittæ..... TRINIA, v. 1. p. 358.

calyx limb of five teeth, or obsolete,

channels with single vittæ HELIOSCLADIUM, v. 1. p. 359

Petals obcordate, with a small incurved
point.

calyx limb obsolete.

Fruit ovate, laterally compressed.

channels with single club-shaped

vittæ SISON, v. 1. p. 362.

channels with many vittæ PIMPINELLA, v. 1. p. 366.

Fruit oblong, laterally compressed.

channels without vittæ..... ÆGOPODIUM, v. 1. p. 363.

channels with single vittæ CARUM, v. 1. p. 364.

channels with many vittæ BUNIUM, v. 1. p. 365.

calyx limb of five leafy teeth.

channels with single vittæ CÍCUTÁ, v. 1. p. 369.

Disk short, conical BERULA, v. 1. p. 371.

Disk flat, depressed SÍUM, v. 1. p. 372.

TRIBE 4. SESELINEÆ.

Calyx limb obsolete.

Petals entire, with an incurved point.

channels with numerous vittæ.

Albumen free in the pericarp CRITHMUM, v. 1. p. 385.

Albumen not free in the pericarp. MEUM, v. 1. p. 384.

channels with single vittæ FENICULUM, v. 1. p. 380.

Petals obcordate, notched, with an in-
flexed point ... CETHUSA, v. 1 p. 378.

Petals oblong, notched, or entire, often
with an appendage at the base SILAUS, v. 1. p. 383.

Calyx with a five toothed limb.

channels with single vittæ.

Styles erect..... ENANTHE, v. 1 p. 373.

Styles reflexed SESELI, v. 1. p. 381.

channels with many vittæ LIGUSTICUM, v. 1. p. 382.

TRIBE 5. ANGELICEÆ.

Calyx limb obsolete ANGELICA, v. 1. p. 388.

Calyx limb of five minute teeth ARCHANGELICA, v. 1 p. 386

TRIBE 6. PEUCEDANEÆ.

Calyx limb of five teeth.

Fruit with a broad plane margin.

channels with single clavate vittæ ... HERACLEUM, v. 1. p. 390.

channels with one to three simple

vittæ PEUCEDANUM, v. 1. p. 394.

Fruit with a thickened crenated margin TORDYLIUM, v. 1. p. 392.

Calyx limb obsolete IMPERATORIA, v. 1. p. 396.

TRIBE 7. DAUCINEÆ.

Fruit with four rows of prickles DAUCUS, v. 1. p. 397.

SUB-ORDER 2. CAMPYLOSPERMEÆ.

TRIBE 8. CAUCALINEÆ.

Secondary ridges hidden, with one to three

rows of prickles CAUCALIS, v. 1. p. 399.

Secondary ridges hidden by the numerous

prickles TORILIS, v. 1. p. 401.

TRIBE 9. SCANDICINEÆ.

Fruit with a long beak..... SCANDIX, v. 1. p. 404.

Fruit with a short beak ANTHRISCUS, v. 1. p. 405.

Fruit without a beak.

Carpel with five equal obtuse ridges ... *CHEROPHYLLUM*, v. 1. p. 407

Carpels with an outer membrane, elevated in hollow keeled ridges ... *MYRRHIS*, v. 1. p. 410.

TRIBE 10. SMYNEÆ.

Calyx limb of five teeth.

Fruit inclosed in a hollow receptacle... *ECHNIOPHORA*, v. 1. p. 414.

Fruit not inclosed in a hollow receptacle *PHYSOSPERMUM*, v. 1. p. 411

Calyx limb obsolete.

carpels with waved ridges *CONIUM*, v. 1. p. 415.

carpels with sharp ridges *SMYRNIUM*, v. 1. p. 413.

SUB-ORDER 3. CÆLOSPERMEÆ.

TRIBE 11. CORIANDREÆ.

Fruit globose..... *CORIANDRUM*, v. 1. p. 417.

ORDER XXXIX. ARALIACEÆ.—Juss.

Perianth double. *Calyx* tube attached to the ovary, the limb four or five toothed. *Petals* five to ten (very rarely wanting), valvate in æstivation. *Stamens* as many as the petals, rarely double the number, inserted beneath the margin of the large epigynous disk. *Anthers* two celled, peltate. *Ovary* of two or many one seeded cells. *Styles* as many as the cells, either separate or united together. *Stigma* simple. *Fruit* dry or succulent, two to many celled, crowned by the entire or toothed limb of the persistent calyx. *Seed* angular, solitary in each cell, its testa crustaceous. *Embryo* small, surrounded by a copious fleshy *albumen*. *Radicle* superior, twice as long as the cotyledons.—*Trees, shrubs, or herbaceous plants, sometimes climbing, or adhering by root-like fibrillæ. Leaves alternate, exstipulate. Flowers in in more or less perfect umbels.*

GENERA.

Small herbaceous plants *ADOXA*, v. 2. p. 580.

Climbing shrubs *HEDERA*, v. 1. p. 330.

ORDER XL CORNEÆ.—DE CAND.

Perianth double. *Calyx* of four sepals, more or less united together, and adnate to the ovary. *Petals* four, oblong, inserted into the upper part of the tube of the calyx, valvate in æstivation. *Stamens* four, inserted with the petals, and alternate with them. *Anthers* ovate oblong, two celled. *Style* filiform. *Stigmas* simple. *Fruit* a drupe, crowned by the limb of the persistent calyx, its nut hard, two celled, each containing a solitary pendulous seed. *Albumen*

fleshy. *Radicle* superior, shorter than the two oblong cotyledons.—*Trees or shrubs, rarely herbaceous. Leaves opposite, or alternate. Flowers in heads, umbellate, or corymbose.*

GENERA.

Flowers in four parts, perfect CORNUS, v. 1. p. 198.

3. COROLLIFLORÆ.

Petals united, bearing the stamens.

ORDER XLI. LORANTHACEÆ.—DON.

Perianth double. *Flowers* perfect, or unisexual. *Calyx* tube surrounded at the base with scales, and attached to the ovary, the *limb* short, entire, or lobed. *Petals* four to eight, more or less united, valvate in æstivation. *Stamens* as many as the petals, and opposite to them. *Filaments* more or less attached to the petals, or wanting. *Stigma* capitate. *Fruit* a one seeded succulent berry. *Albumen* fleshy. *Radicle* superior, thickened or truncated at the apex.—*Generally parasitical plants, with opposite entire more or less fleshy leaves.*

GENERA.

Flowers dioecious VISCUM, v. 3. p. 1278.

ORDER XLII. CAPRIFOLIACEÆ.—JUSS.

Perianth double. *Calyx* of five or four sepals, united into a tube and attached to the ovary, the limb four or five lobed. *Petals* as numerous as the lobes of the calyx, more or less united into a tube at the base, regular or irregular. *Stamens* the same number as the lobes of the corolla, and attached to it. *Ovary* three to five celled. *Stigmas* one to three. *Fruit* usually a berry, crowned by the persistent limb of the calyx, one or many celled, each cell one or many seeded. *Embryo* in the middle of the fleshy *albumen*. *Radicle* superior.—*Shrubs with exstipulate leaves. Flowers mostly corymbose, and sweet scented.*

GENERA.

Stigmas sessile.

corolla rotate..... SAMBUCUS, v. 1. p. 440.

corolla campanulate VIBURNUM, v. 1. p. 438.

Stigmas on a filiform style.

corolla tubular, or funnel shaped..... LONICERA, v. 1. p. 305.

corolla campanulate, or turbinate LINNEA, v. 2. p. 807 p

ORDER XLIII. STELLATÆ.—LIND.

(RUBIACEÆ, JUSS.)

Perianth double. *Calyx* attached to the ovary, superior, four or five, rarely six lobed. *Corolla* monopetalous, regular, rotate, or tubular, inserted into the tube of the calyx, and with as many divisions, as there are lobes to the calyx. *Stamens* inserted into the corolla, equal in number to its lobes, and alternating with them. *Ovary* simple, one or two celled. *Style* single. *Stigmas* equal in number to the cells of the ovary. *Fruit* a dry indehiscent pericarpium, with two cells and two seeds. *Seeds* erect, solitary. *Embryo* straight in the axis of horny albumen. *Radicle* inferior. *Cotyledons* leafy.—*Herbaceous plants, with whorled leaves and square stems. Flowers minute.*

GENERA.

Corolla rotate, or campanulate.

Fruit dry GALIUM, v. 1. p. 178.

Fruit succulent..... RUBIA, v. 1. p. 188.

Corolla funnel-shaped.

Fruit crowned with the six toothed

calyx limb SHERARDIA, v. 1. p. 189

Fruit not crowned with the limb of the

calyx ASPERULA, v. 1. p. 189.

ORDER XLIV. VALERIANÆÆ.—DE CAND.

Perianth double. *Calyx* superior, its tube attached to the ovary, the limb either membranous, or resembling pappus. *Corolla* monopetalous, tubular, three to five lobed, regular or irregular, sometimes spurred at the base, inserted into the top of the ovary. *Stamens* one to five, inserted into the tube of the corolla, and alternating with its lobes. *Ovary* inferior, with one perfect cell, and often two abortive cells. *Style* filiform. *Stigmas* one to three. *Fruit* dry, membranous, with the fertile cell containing a solitary pendulous seed. *Albumen* wanting. *Embryo* straight. *Radicle* superior. *Cotyledons* flat.—*Herbaceous plants, with opposite exstipulate leaves.*

GENERA.

Fruit crowned with feathery pappus VALERIANA, v. 1. p. 34

Fruit crowned with the unequal toothed

limb of the calyx FEDIA, v. 1. p. 36.

ORDER XLV. DIPSACEÆ.—VAILL.

Perianth double. *Calyx* superior, membranous, its limb resembling pappus, surrounded by a scarious involucre. *Corolla* mono-

petalous, tubular, inserted into the upper part of the calyx, the limb obliquely four or five lobed, with an imbricated aestivation. *Stamens* four or five, inserted into the tube of the corolla, and alternate with its lobes. *Anthers* distinct. *Ovary* one celled, single seeded. *Style* single. *Stigma* simple. *Fruit* dry, one celled, crowned by the pappus-like calyx. *Seed* solitary, pendulous. *Embryo* straight in the axis of fleshy albumen; radicle superior.—*Herbaceous plants or undershrubs. Leaves opposite, or whorled. Flowers collected upon a common receptacle, and surrounded by a many leaved involucre.*

GENERA.

- Fruit with four sides, and eight little depressions DIPSAcus, v. 1. p. 173.
 Fruit with four sides, and four little depressions KNAUTIA, v. 1. p. 176.
 Fruit nearly cylindrical, and with eight excavations SCABIOSA, v. 1. p. 177.

ORDER XLVI. COMPOSITÆ.—Juss.

Perianth double. *Calyx* superior, its tube closely adhering to the ovary, and undistinguished from it, the limb either wanting, or membranous, divided into bristles, paleæ, hairs or feathers, and called *pappus*. *Corolla* monopetalous, superior, tubular, and five lobed, or tubular, with a bilobate limb, or ligulate, and four or five toothed. *Stamens* usually five, wanting, or rudimentary. *Anthers* erect, united into a tube around the style. *Ovary* inferior, one celled. *Style* simple. *Stigmas* two, either distinct or united. *Fruit* a dry one celled pericarp, crowned with the limb of the calyx, articulated on the receptacle, and generally sessile. *Seed* solitary, erect. *Embryo* erect, with a taper inferior radicle. *Albumen* wanting—*Herbaceous plants or shrubs. Leaves usually simple, without stipules. Flowers (called florets) collected into dense heads upon a common receptacle, surrounded by an involucre, and either naked or furnished with scales called paleæ.*

SUB-ORDERS.

- Style not jointed at the end. Flowers all tubular, or those of the ray ligulate...* 1. CORYMBIFERÆ.
Style jointed at the end. Flowers all tubular, or those of the ray ligulate... 2. CYNAROCEPHALEÆ.
Style not jointed at the end. Flowers all ligulate and perfect 3. CICHORACEÆ.

SUB-ORDER 1. CORYMBIFERÆ.

GENERA.

Florets of the disk tubular, of the ray ligulate.

Fruit crowned with hair-like pappus.

Florets of the ray of a different colour
from those of the disk.

Pappus in many rows ASTER, v. 3. p. 1076.

Pappus in a single row ERIGERON, v. 3. p. 1077.

Florets of the ray of the same colour as
those of the disk.

Scales of the involucre in one or two
rows.

Flowers solitary, on a scape TUSSILAGO, v. 3. p. 1086.

Flowers on a leafy stem.

Involucre simple CINERARIA, v. 3. p. 1080.

Involucre with bracteate scales
at the base..... SENEIO, v. 3. p. 1081.

Involucre a double row of equal
scales..... DOBONICUM, v. 3. p. 1087.

Scales of the involucre imbricated.

Pappus hairy, in a single row.

Anthers bristle, pointed at the
base INULA, v. 3. p. 1078.

Anthers not bristle, pointed at
the base..... SOLIDAGO, v. 3. p. 1079.

Pappus in a double row, the outer
row cup-shape scales..... PULICARIA, v. 3. p. 1075.

Fruit naked, or crowned with a membra-
nous margin or toothed.

Receptacle naked, or slightly hairy.

Flowers solitary, on a scape or naked
stem BELLIS, v. 3. p. 1088.

Flowers on a leafy stem.

Involucre scales membranous on
the margin.....CHRYSANthemum v.3p.1090

Involucre scales not membranous
on the margin MATRICARIA, v. 3. p. 1093.

Receptacle furnished with scales (pa-
leaceous).

Receptacle conical ANthemis, v. 3. p. 1093.

Receptacle flat.

Pappus formed of two to five awns BIDENS, v. 3. p. 1071.

Pappus a membranous margin, or
wanting Achillea, v. 3. p. 1097.

Florets all tubular (those of the ray rarely
ligulate).

Receptacle naked, or hairy.

Pappus hairy.

Involucre with imbricated scales.

Scales of involucre oblong EUPATORIUM, v. 3. p. 1059.

- Scales of involucre linear..... CHRYSOCOMA, v. 3. p. 1061.
 Scales of involucre unequal,
 membranous GNAPHALIUM, v. 3. p. 1063.
 Involucre with two rows of scales PETASITES, v. 3. p. 1060.
 Pappus wanting ARTEMISIA, v. 3. p. 1067.
 Pappus a membranous margin TANACETUM, v. 3. p. 1070.
 Receptacle tuberculated, or paleaceous.
 Pappus hairy, often wanting FILAGO, v. 3. p. 1061.
 Pappus from two to five awns..... BIDENS, v. 3. p. 1071.
 Fruit crowned by the lower half of
 the persistent corolla DIOTIS, v. 3. p. 1072.
 Fruit inclosed in a hardened invo-
 lucre XANTHIUM, v. 3. p.
 SUB-ORDER 2. CYNAROCEPHALÆE.
 Receptacle excavated like a honey comb ONOPORDIUM, v. 3. p. 1046.
 Receptacle paleaceous
 Pappus in a double row SAUSSUREA, v. 3. p. 1058.
 Pappus in a single row
 Feathery, and united into a ring
 at the base.]
 Inner scales of the involucre
 membranous spreading like
 rays..... CARLINA, v. 3. p. 1047.
 Involucre scales simple, spinous
 at the point CIRSIIUM, v. 3. p. 1750.
 Hairy.
 United into a ring at the base... CARDUUS, v. 3. p. 1048.
 Unequal, rigid.
 Involucre scales hooked at
 the apex..... LAPPA, v. 3. p. 1056.
 Involucre scales acute at the
 point, entire SERRATULA, v. 3. p. 1057.
 Equal, soft, or wanting.
 Involucre scales spiny, or torn CENTAUREA, v. 3. p. 1099.
 SUB-ORDER 3. CICHORACEÆ.
 Pappus feathery.
 Receptacle paleaceous HYPOCHERIS, v. 3. p. 1017.
 Receptacle naked.
 Involucre simple, equal scales TRAGOPOGON, v. 3. p. 1019.
 Involucre with imbricated scales.
 Fruit transversely striated.
 gradually tapering into a point PICRIS, v. 3. p. 1021.
 beak long, slender, capillary HELMINTHIA, v. 3. p. 1025.
 Fruit angularly striated.
 beak very short..... APARGIA, v. 3. p. 1022.
 beak very long, slender LEONTODON, v. 3. p. 1024.

- Pappus of the ray cup-like scales, of the
 disk feathery *THRINICIA*, v. 3. p. 1021.
- Pappus sessile scales *CICHOBIUM*, v. 3. p. 1043.
- Pappus hair-like.
 Stalked.
 Involucre scales membranous on the
 margin *LACTUCA*, v. 3. p. 1026.
- Involucre scales awl-shaped, deci-
 duous *BARKHAUSIA*, v. 3. p. 1032.
- Sessile.
 Fruit with a truncated apex *SONCHUS*, v. 3. p. 1029.
- Fruit with a sharp pointed apex..... *CREPIS*, v. 3. p. 1033.
- Fruit with a marginal ring at the top *HIERACIUM*, v. 3. p. 1036.
- Pappus wanting.
 Fruit compressed *LAPANA*, v. 3. p. 1044.
- Fruit pentagonal, furrowed ...?..... *ARNOSEBIS*, v. 3. p. 1045.

ORDER XLVII. CAMPANULACEÆ.—Juss.

Perianth double. *Calyx* persistent, five lobed, superior. *Corolla* monopetalous, inserted into the upper part of the tube of the calyx, five lobed, withering on the fruit, regular, valvate in æstivation. *Stamens* generally five, inserted into the calyx beneath the corolla, but alternate with its lobes. *Anthers* generally distinct, sometimes united. *Pollen* spherical. *Ovary* inferior, glandular above. *Style* simple. *Stigma* two to five lobed. *Fruit* a dry three to five celled capsule, crowned by the withered calyx and corolla, opening by lateral apertures, or by incomplete valves at the apex. *Seeds* numerous, attached to a placenta in the axis of the cells. *Embryo* straight in the centre, of fleshy albumen. *Radicle* inferior.—*Herbaceous plants or undershrubs. Leaves alternate. Flowers single, or numerous in heads, with an involucre.*

GENERA.

- Filaments dilated at the base.
 Corolla wheel-shaped, with linear seg-
 ments *PHYTEUMA*, v. 1. p. 291.
- Corolla campanulate, or wheel-shaped,
 with short acute segments *CAMPANULA*, v. 1. p. 293.
- Filaments not dilated at the base.
 Anthers united at the base *JASIONE*, v. 1. p. 290.
- Anthers free *PRISMATOCARPUS*, v. 1. p. 304

ORDER XLVIII. LOBELIACEÆ.—Juss.

Perianth double. *Calyx* superior, five lobed, or entire. *Corolla* monopetalous, inserted into the calyx, irregular, five lobed, with a

deep longitudinal fissure above. *Stamens* five, inserted into the calyx, alternate with the lobe of the corolla. *Anthers* cohering. *Pollen* oval. *Ovary* inferior, mostly two celled. *Style* simple. *Stigma* surrounded with a cup-like fringe. *Fruit* a two rarely four celled capsule, opening at the apex. *Seeds* numerous, attached to the sides or axis of the cells. *Embryo* straight in the axis of fleshy albumen, radicle pointed towards the hilum.—*Herbaceous plants or shrubs. Leaves alternate, exstipulate. Flowers axillary, or terminal.*

GENERA.

Corolla two lipped..... LOBELIA, v. 1. p. 287.

ORDER XLIX. ERICACEÆ.—LIND.

Perianth double. *Calyx* four or five-cleft, inferior,¹ persistent. *Corolla* hypogynous, monopetalous, four or five-cleft, occasionally separable into four or five pieces, regular or irregular, often persistent, imbricated in æstivation. *Stamens* definite, equal in number to the segments of the corolla, or twice as many, hypogynous, or scarcely inserted into the base of the corolla. *Anthers* two celled, the cells hard and dry, separate at the apex or base, [where they are furnished with some kind of appendage, and opening by a pore. *Ovary* surrounded at the base by a disk, or secreting scales. *Style* single, straight. *Stigma* undivided, or toothed. *Fruit* capsular, many celled, *placenta* central, *dehiscing* variously. *Seeds* numerous, minute, *testa* firmly adhering to the nucleus. *Embryo* cylindrical in the axis of fleshy albumen. *Radicle* opposite the hilum.—*Shrubs or undershrubs. Leaves evergreen, rigid, entire, whorled or opposite, exstipulate. Inflorescence variable, the pedicels generally bracteated.*

GENERA.

Fruit baccate.

Anthers with two pores at the apex;

berry granulated ARBUTUS, v. 2. p. 592.

Anthers without pores; berry smooth ARCTOSTAPHYLOS, v. 2. p. 594.

Fruit dry, capsular.

Calyx five-cleft.

Calyx coloured AZALEA, v. 2. p.

Calyx green ANDROMEDA, v. 2. p. 691.

Calyx four-cleft.

Calyx coloured CALLUNA, v. 2. p. 562.

Calyx green.

Capsule dehiscing at the middle

of the valves MENZIESIA, v. 2. p. 555.

Capsule dehiscing at the sutures ERICA, v. 2. p. 557.

ORDER L. PYROLACEÆ.—LIND.

Perianth double. *Calyx* five persistent pieces, inferior. *Corolla* monopetalous, hypogynous, regular, deciduous, four or five toothed, with an imbricated aestivation. *Stamens* hypogynous, twice as numerous as the divisions of the corolla. *Anthers* two celled, opening by pores, and furnished with appendages at the base. *Ovary* superior, four or five celled, with a hypogynous disk. *Style* single, straight, or curved. *Stigma* rounded, or lobed. *Fruit* a three to five celled capsule, dehiscent, with central placenta. *Seeds* indefinite, minute, winged. *Embryo* minute at the base of fleshy albumen.—*Herbaceous plants, rarely undershrubs. Stem round, naked, or leafy. Leaves simple, toothed, or entire. Flowers in terminal racemes, or solitary.*

GENERA.

Petals five, stamens ten, capsule five
celled PYROLA, v. 2. p. 586.

ORDER LI. MONOTROPACEÆ.—LIND.

In all things the same as Pyrolaceæ, except *style* straight. *Anthers* bursting longitudinally. *Embryo* minute at the apex of fleshy albumen. *Stems* leafless, or nearly so, but covered with fleshy scales—*Parasiticol plants.*

GENERA.

Perianth single, of four or five pieces..... MONOTROPA, v. 2. p. 585.

ORDER LII. VACCINIACEÆ.—LIND.

Perianth single. *Calyx* superior, entire, or four to six lobed. *Corolla* monopetalous, lobed, as often as the calyx, inserted into an epigynous disk. *Stamens* distinct, double the number of the lobes of the corolla, inserted into the disk. *Anthers* with two horns, two celled, opening by pores. *Ovary* inferior, four or five celled, one or many seeded. *Style* simple. *Stigma* simple. *Berry* persistent, succulent, crowned with the calyx. *Seeds* minute. *Embryo* straight, in the axis of a fleshy albumen. *Cotyledons* very short. *Radicle* very long, inferior.—*Undershrubs with alternate coriaceous leaves.*

GENERA.

Corolla urceolate or campanulate, berry
globose, umbilicated..... VACCINIUM, v 2 p. 552.

ORDER LIII. ILICINÆ.—BROU.

Perianth double. *Calyx* of four to six inferior sepals, imbricated in æstivation. *Corolla* regular, four to six parted, imbricated in æstivation. *Stamens* inserted into the corolla, and alternating with its segments. *Filaments* erect. *Anthers* adnate. *Ovary* fleshy, superior, somewhat truncate, with from two to six cells. *Ovules* solitary, pendulous, from a cup-shaped funiculus. *Stigma* sub-sessile, lobed. *Fruit* fleshy, indehiscent, with from two to six stones. *Seed* suspended, nearly sessile. *Albumen* large, fleshy. *Embryo* small, two lobed, lying next the hilum, with minute *cotyledons* and superior *radicle*.—*Trees or shrubs*. *Leaves* coriaceous. *Flowers* small, axillary, solitary, or fascicled.

GENERA.

Corolla rotate. stigmas four or five, nearly sessile..... ILEX, v. 1. p. 205.

ORDER LIV. OLEACEÆ.—LIND.

Flowers perfect, sometimes diœcious. *Calyx* monosepalous, divided, persistent, inferior. *Corolla* hypogynous, monopetalous, four-cleft, occasionally of four petals, connected in pairs by the intervention of the filaments, sometimes without petals. *Stamens* two alternate with the segments of the corolla, or with the petals. *Anthers* two celled, opening longitudinally. *Ovary* simple, two celled, the cells two seeded. *Style* single, or wanting. *Stigma* bifid, or undivided. *Fruit* a berry, or dry capsule, often by abortion, single seeded. *Seed* with dense fleshy *albumen*, abundant. *Embryo* straight, about half its length. *Cotyledons* foliaceous. *Radicle* superior.—*Trees or shrubs*. *Leaves* opposite, simple, sometimes pinnated. *Flowers* in terminal or axillary racemes or panicles, the pedicels opposite, with single bracts.

GENERA.

Fruit a fleshy berry LIGUSTRUM, v. 1. p. 4.
Fruit a dry pendulous samara..... FRAXINUS, v. 1. p. 27.

ORDER LV. APOCYNÆÆ.—JUSS.

Perianth double. *Calyx* with five divisions, persistent. *Corolla* monopetalous, hypogynous, five lobed, regular, with contorted æstivation, deciduous. *Stamens* five, inserted into the corolla, and alternate with its segments. *Filaments* distinct. *Anthers* two celled, opening lengthwise. *Ovaries* two, or one two celled. *Styles* one or two. *Stigma* capitate. *Fruit* a follicle, capsule, or drupe or berry double

or single. *Seeds* numerous, with fleshy or cartilaginous *albumen*. *Embryo* foliaceous. *Radicle* turned towards the hilum.—*Herbs, trees, or shrubs, sometimes climbing, often with milky juices. Leaves entire.*

GENERA.

Stigma single, corolla mouth five angled,
closed with valves..... VINCA, v. 1. p. 283.

ORDER LVI. GENTIANÆ.—JUSS.

Perianth double. *Calyx* monophyllus, divided, persistent, inferior. *Corolla* monopetalous, hypogynous, usually regular and persistent, the limb divided, equal, its lobes of the same number as those of the calyx, usually five, sometimes more. *Stamens* inserted on the corolla, as many as and alternate with its segments. *Ovary* single, one or two celled. *Style* one. *Stigmas* one or two. *Fruit* a one or two celled capsule or berry, generally two valved, the margin of the valves turned inwards, which in the one celled genera bear the seeds; in the two celled genera inserted upon a central placenta. *Seeds* small, numerous. *Embryo* straight in the axis of soft fleshy albumen. *Radicle* generally inferior.—*Herbaceous plants, with bitter juices. Leaves opposite, entire, generally sessile, and sheathed at the base.*

GENERA.

Leaves opposite.

Stamens four..... EXACUM, v. 1. p. 192.

Stamens five.

Capsule two celled ERYTHREA, v. 1. p. 257.

Capsule one celled GENTIANA, v. 1. p. 385.

Stamens eight CHLORA, v. 2. p. 564.

Leaves alternate.

trifoliate..... MENYANTHES, v. 1. p. 254.

entire VILLARSLA, v. 1. p. 255.

ORDER LVII. POLEMONIACEÆ.—LIND.

Perianth double. *Calyx* monosepalous, five-partite, persistent. *Corolla* regular, five lobed, *Stamens* five, inserted into the middle of the tube of the corolla, and alternate with its segments. *Ovary* superior, free, three celled. *Style* simple. *Stigma* trifid. *Capsule* covered with the persistent calyx, three celled, three valved, few or many seeded. *Valves* having a prominent rib or septum in the middle, which extends to the central trigonal axis. *Seeds* often

enveloped in mucus, ascending. *Embryo* straight, in the axis of horny albumen. *Radicle* inferior. *Cotyledons* elliptic, foliaceous.—*Herbaceous plants, with opposite, or occasionally alternate, compound, or simple leaves.*

GENERA.

Corolla rotate, closed at the base by stamiferous valves POLEMONIUM, v. 1. p. 260.

ORDER LXVIII. CONVULVULACEÆ.—CHOIS.

Perianth double. *Calyx* of five sepals, equal or unequal, persistent, remarkably imbricated, often becoming enlarged. *Corolla* monopetalous, hypogynous, regular, deciduous, limb five lobed, plaited. *Stamens* five, inserted into the base of the corolla, and alternate with its segments. *Ovary* single, two to four celled, sometimes in two or four divisions. *Disk* annular, hypogynous. *Style* single, entire, or bifid. *Stigma* two lobed. *Capsule* two to four celled, the valves fitting at their edges to the angles of a loose dissepiment, bearing the seed at its base. *Seeds* with a small quantity of mucilaginous albumen, when single erect, when more than one in each cell collateral. *Embryo* curved. *Cotyledons* corrugated. *Radicle* inferior.—*Herbaceous plants or shrubs, usually twining. Leaves alternate, simple, or lobed, seldom pinnatifid, without stipules. Flowers axillary or terminal, peduncles one or many flowered, the partial ones generally with two bracts.*

GENERA.

Stem leafless, parasitical CUSCUTA, v. 1. p. 340.

Stem leafy, twining CONVULVULUS, v. 1. p. 261.

ORDER LIX. BORAGINÆÆ.—JUSS.

Perianth double. *Calyx* five lobed, persistent. *Corolla* five lobed, generally regular, monopetalous, with an imbricated aestivation, the throat naked, or closed with fine scales. *Stamens* five, inserted into the corolla, and alternate with its lobes. *Ovary* two to four lobed. *Style* simple, persistent, arising from between the lobes of the ovary. *Stigma* simple, or bifid. *Fruit* two to four. *Nuts* one celled, single seeded. *Seeds* separable from the pericarps, without albumen. *Embryo* straight. *Radicle* inferior. *Cotyledons* foliaceous.—*Herbaceous plants or shrubs, with alternate generally rough leaves, the asperities arising from an indurated enlarged base. Flowers mostly in one-sided gyrate spikes or racemes, or panicles rarely solitary and axillary.*

GENERA.

Throat of the corolla naked.

Corolla with unequal segments ECHIUUM, v. 1. p. 220.

Corolla with equal segments.

Calyx prismatic, five-cleft at the margin. Stigma notched PULMONARIA, v. 1. p. 221.

Calyx five-partite. Stigma bifid..... LITHOSPERMUM, v. 1. p. 223

Throat of the corolla furnished with scales.

Calyx unequal, five-cleft, with intermediate teeth..... ASPERUGO, v. 1. p. 230.

Calyx equal, five-cleft.

Corolla cylindrical, campanulate SYMPHYTUM, v. 1. p. 226.

Corolla rotate BORAGO, v. 1. p. 228.

Corolla salver-shaped..... MYOSOTIS, v. 1. p. 231.

Corolla funnel-shaped.

Tube curved LYCOPSIIS, v. 1. p. 229.

Tube straight.

Nuts excavated at the base ANCHUSA, v. 1. p. 230.

Nuts not excavated at the base, depressed..... CYNOGLOSSUM, v. 1. p. 239.

ORDER LX. SOLANÆÆ.—Juss.

Perianth double. *Calyx* inferior, persistent, four, rarely five-parted. *Corolla* monopetalous, hypogynous, generally regular, the limb five, rarely four-cleft, deciduous, plaited or imbricated in æstivation. *Stamens* inserted into the base of the corolla, as many as and alternate with the lobes of the limb. *Anthers* bursting longitudinally, rarely by pores at the apex. *Ovary* free, two celled, rarely four or many celled. *Styles* single. *Stigma* simple. *Fruit* either a two celled capsule, the dissepiments parallel with the valves, or a berry, the receptacle seminiferous, and central. *Seeds* numerous. *Embryo* straight, or curved in fleshy albumen. *Radicle* next the hilum.—*Herbaceous plants or shrubs, with alternate simple or lobed leaves.*

GENERA.

Fruit dry, capsular.

Corolla funnel-shaped.

Calyx tubular, with five teeth, persistent HYOSCYAMUS, v. 1. p. 275.

Calyx tubular, five angled, five toothed, deciduous DATURA, v. 1. p. 273.

Corolla rotate VERBASCUM, v. 1. p. 264.

Fruit fleshy, baccate.

Corolla rotate SOLANUM, v. 1. p. 281

Corolla campanulate..... ATROPA, v. 1. p. 278.

ORDER LXI. OROBANCHEÆ.—Juss.

Perianth double. *Calyx* divided, bracteate, persistent, inferior. *Corolla* monopetalous, hypogynous, irregular, persistent, with an imbricated æstivation. *Stamens* four, didymous, inserted into the corolla. *Anthers* two cells, the celled distinct, parallel, often mucronate, or bearded at the base. *Ovary* superior, one celled, seated in a fleshy disk. *Style* single. *Stigma* two lobed. *Fruit* capsular, inclosed within the withered corolla, one celled, two valved, each valve bearing one or two placentæ in the middle. *Seeds* numerous, very minute. *Albumen* fleshy. *Embryo* very minute.—*Herbaceous leafless plants, growing parasitically upon the roots of other plants. Stem covered with brownish scales.*

GENERA.

Calyx one or two partite, corolla ringent,
four or five-cleft..... OROBANCHE, v. 2. p. 835.

Calyx campanulate, four-cleft, corolla bi-
labiate LATHRÆA, v. 2. p. 841.

ORDER LXII. SCROPHULARINEÆ.—Juss.

Perianth double. *Calyx* inferior, four or five-cleft, or free, unequal, imbricated in æstivation. *Corolla* monopetalous, with a long or short tube, the limb nearly equally divided, or bi-labiate, imbricated in æstivation. *Stamens* simple, opposite the sepals, the upper ones entirely wanting, or sterile, very rarely fertile, shorter than the others, the two lateral equal, rarely abortive, the two lower equal to or longer than the lateral ones, sometimes wanting, often sterile. *Anthers* two or one celled, bursting longitudinally. *Ovary* free, superior, two celled. *Style* simple, rarely slightly bifid. *Stigma* generally simple, entire, notched, or bifid. *Fruit* capsular, rarely baccate, two celled, two or many seeded, dehiscing by valves or pores. *Dissepiment* parallel, or opposite to the valves, becoming loose in the centre, or altogether free. *Placenta* adhering to the dissepiments, sometimes when mature separate, and forming one or two central columns. *Seeds* mostly numerous. *Embryo* variously placed in the albumen.—*Inodorous or fetid herbs or shrubs.*

GENERA.

- Stamens two..... VERONICA, v. 1. p. 5.
 Stamens four.
 Corolla regular.
 Rotate, ovary two celled SIBTHORPIA, v. 2. p. 865.
 Campanulate, ovary one celled LIMOSELLA, v. 2. p. 853.
 Corolla irregular, mostly two lipped.
 Calyx inflated.
 Four-cleft RHINANTHUS, v. 2. p. 844.
 Five-cleft PEDICULARIS, v. 2. p. 842.
 Calyx tubular, four-cleft.
 Corolla with upper lip arched,
 entire BARTSIA, v. 2. p. 849.
 Corolla with upper lip divided ... EUPHRASIA, v. 2. p. 851.
 Corolla with upper lip compressed
 laterally MELAMPYRUM, v. 2. p. 846.
 Calyx five-cleft or five partite.
 Corolla personate.
 Spurred at the base LINARIA, v. 2. p. 859.
 Not spurred at the base ANTIRRHINUM, v. 2. p. 858.
 Corolla sub-globose SCROPHULARIA, v. 2. p. 854.
 Corolla campanulate, inflated be-
 neath DIGITALIS, v. 2. p. 864.

ORDER LXIII. LABIATEÆ.—Juss.

Perianth double. *Calyx* inferior, persistent, tubular, either five toothed with the fifth tooth superior and next the axis, or ten toothed regular or irregular, bi-labiate. *Corolla* monopetalous, hypogynous, bi-labiate, deciduous, the upper lip entire, or bifid, the lower larger, three lobed. *Stamens* four, didynamous, inserted upon the corolla, and alternate with its lobes, the two upper sometimes wanting. *Anthers* two celled, sometimes apparently two celled, in consequence of the cells being united at the apex, or the cells are separated by a bifurcation of the connectivum. *Ovary* deeply four lobed, seated in a fleshy hypogynous disk, each lobe containing an erect ovule. *Style* single, bifid, arising from the base of the lobes of the ovary. *Stigma* bifid. *Fruit* one to four nuts, enclosed within the persistent calyx. *Seeds* erect, with little or no albumen. *Embryo* erect, deeply cleft. *Cotyledons* straight, or curved at the apex. *Radicle* straight, or slightly curved.—*Herbaceous plants or undershrubs*. *Stem* four angled, with opposite branches. *Leaves* opposite, divided, or simple, without stipules, furnished with glands, secreting a volatile oil. *Flowers* in opposite nearly sessile axillary cymes, resembling whorls, sometimes solitary, or as if capitate.

GENERA.

Stamens two.

Corolla tubular, four-cleft, nearly equal. *LYCOPUS*, v. 1. p. 23.

Corolla labiate, lower lip three lobed,
the upper concave..... *SALVIA*, v. 1. p. 23.

Stamens four.

Upper stamens longer than the lower.

Calyx five toothed..... *NEPETA*, v. 2. p. 809.

Calyx two lipped.

Flowers with linear bracteas *CLINOPODIUM*, v. 2. p. 806.

Flowers without linear bracteas ... *CALAMINTHA*, v. 2. p. 808.

Upper stamens shorter, or equal to the
lower.

Corolla tube not longer than the
calyx, limb nearly equal.

Limb four-cleft *MENTHA*, v. 2. p. 797.

Limb five-cleft, obscurely two lipped

Calyx two lipped, the upper
three toothed, patent *THYMUS*, v. 2. p. 804.

Calyx tubular, five toothed,
nearly equal *ORIGANUM*, v. 2. p. 805.

Corolla apparently one lipped.

Upper lip minute *AJUGA*, v. 2. p. 830.

Upper lip with deflexed lobes, or
very short and erect *TEUCRIUM*, v. 2. p. 832.

Corolla tube much longer than the
calyx, distinctly two lipped.

Calyx two lipped.

Lips both entire *SCUTELLARIA*, v. 2. p. 828.

Lower lip two lobed..... *PRUNELLA*, v. 2. p. 829.

Calyx with three or four rounded
leafy lobes *MELITTIS*, v. 2. p. 827.

Calyx regularly five to ten toothed,
not two lipped.

Stamens longer than the tube of
the corolla.

Corolla with its throat in-
flated.

Lower lip of three unequal
lobes *GALEOPSIS*, v. 2. p. 815.

Lower lip two lobed..... *LAMIUM*, v. 2. p. 811.

Corolla with a cylindrical tube

Upper lip very hairy *LEONURUS*, v. 2. p. 825.

Upper lip not very hairy.

Calyx ovate *BETONICA*, v. 2. p. 816.

Calyx campanulate.

Five ribbed	GALEOBDOLOX, v. 2. p. 815.
Ten ribbed	STACHYS, v. 2. p. 819.
Calyx salver-shaped	BALLOTA, v. 2. p. 824.
Calyx tubular.....	GLECOMA, v. 2. p. 810.
Stamens included within the tube of the corolla	MARRUBIUM, v. 2. p. 826.

ORDER LXIV. VERBENACEÆ.—Juss.

Perianth double. *Calyx* tubular, persistent, inferior. *Corolla* hypogynous, monopetalous, tubular, deciduous, mostly with an irregular limb. *Stamens* usually four, didymous, seldom equal, occasionally two. *Ovary* free, two to four celled. *Ovules* erect, solitary, or in pairs. *Style* single. *Stigma* bifid, or undivided. *Fruit* nut-like, sometimes a berry, containing one to four one seeded nuts, in a state of adhesion. *Embryo* straight. *Radiols* inferior. *Albumen* very little, or wanting.—*Trees, shrubs, or herbaceous plants. Leaves opposite, simple, or compound, without stipules.*

GENERA.

Calyx five-cleft. Seeds inclosed in an
utricular tissue VERBENA, v. 2. p. 869.

ORDER LXV. LENTIBULARIÆ.—Rich.

Perianth double. *Calyx* divided, persistent, inferior. *Corolla* monopetalous, hypogynous, irregular, bi-labiate, spurred. *Stamens* two, included within the corolla, and inserted into its base. *Anthers* simple, sometimes contracted in the middle. *Ovary* one celled. *Style* one, very short. *Stigma* bi-labiate. *Capsule* one celled, many seeded, with a large central placenta. *Seed* small, exalbuminous. *Embryo* sometimes undivided.—*Herbaceous plants, living in water or marshy places. Leaves radiols, undivided, or compound, resembling roots, and bearing little vesicles. Flowers single, on a scape, or in spikes, or many flowered, racemes generally with a single bract.*

GENERA.

Calyx five-cleft, bifid..... PINGUICULA, v. 1. p. 17.
Calyx of two equal undivided lips UTRICULARIA, v. 1. p. 20.

ORDER LXVI. PRIMULACEÆ.—Vent.

Perianth double. *Calyx* inferior, persistent, regular, four or five cleft. *Corolla* monopetalous, hypogynous, regular, the limb five, seldom four-cleft. *Stamens* inserted into the corolla opposite to its lobes, and of the same number. *Ovary* free, one celled. *Style* single. *Stigma* capitate. *Capsule* opening with valves, one celled, many seeded. *Placenta* central, distinct. *Seeds* peltate. *Embryo*

straight, within fleshy albumen.—*Herbaceous plants. Leaves usually opposite, either whorled or scattered.*

GENERA.

- Leaves pectinate HOTTONIA, v. 1. p. 247.
 Leaves not pectinate.
 Stamens four..... CENTUNCULUS, v. 1. p. 196.
 Stamens five.
 Capsule when ripe bursting transversely by a circular fissure..... ANAGALLIS, v. 1. p. 248.
 Capsule bursting at the apex.
 Corolla inferior, with reflexed segments..... CYCLAMEN, v. 1. p. 241.
 salver-shaped PRIMULA, v. 1. p. 242.
 wheel-shaped LYSIMACHIA, v. 1. p. 250.
 Corolla half superior, its mouth surrounded with five scales. SAMOLUS, v. 1. p. 286.
 Corolla wanting, calyx coloured ... GLAUX, v. 1. p. 332.
 Stamens seven TRIENTALIS, v. 2. p. 539.

ORDER LXVII. PLUMBAGINEÆ.—DE CAND.

Perianth double, persistent. *Calyx* tubular, plaited. *Corolla* monopetalous, or of five regular petals. *Stamens* five, inserted on the receptacle in the monopetalous plants, but to the base of the petals in the polypetalous plants. *Ovary* free, simple, superior, one seeded. *Ovule* inverted, pendulous from the point, of an umbilical cord, arising from the bottom of the cavity. *Styles* five, seldom three or four. *Stigmas* the same number. *Fruit* a single seeded indehiscent capsule. *Embryo* compressed, surrounded by a farinaceous albumen.—*Herbs or undershrubs. Leaves entire, simple. Flowers either in loose panicles, or contracted into heads or spikes.*

GENERA.

- Calyx of one piece, membranous, persistent..... STATICE, v. 1. p. 447.

ORDER LXVIII. PLANTAGINEÆ.—Juss.

Perianth double. *Calyx* four-partite, persistent. *Corolla* membranous, persistent, monopetalous, hypogynous, the limb four-partite. *Stamens* four, inserted into the tube, and alternate with the segments. *Filaments* exerted, doubled inwards in aestivation. *Anthems* versatile, two celled. *Ovary* free, simple. *Style* simple, capillary. *Stigma* hispid, simple, rarely semi-bifid. *Capsule* membranous, dehiscent

transversely, divided into two or four cells by a longitudinal dissepiment. *Seeds* sessile, peltate, or erect, single, or more, testa mucilaginous. *Embryo* straight in the axis of fleshy albumen. *Radiole* inferior.—*Herbaceous, usually stemless, occasionally with a stem. Leaves flat and ribbed, or taper and fleshy. Flowers in spikes, rarely solitary.*

GENERA.

Flowers perfect PLANTAGO, v. 1. p. 192.
Flowers monœcious LITTORELLA, v. 3. p. 1189.

4. MONOCHLAMYDEÆ.

Perianth single, the petals being united with the calyx, or wanting.

ORDER LXIX. AMARANTHACEÆ.—JUSS.

Perianth single, free, scarious, persistent, three to five lobed, often coloured. *Stamens* three or five, hypogynous, free or united, occasionally partly abortive. *Anthers* two or one celled. *Ovary* superior, one (rarely two celled), one or few seeded. *Style* one, or wanting. *Stigma* simple, or compound. *Fruit* a membranous capsule, dehiscent transversely, or indehiscent. *Seeds* solitary, or rarely numerous, attached to a central placenta. *Embryo* curved, round, central, farinaceous albumen. *Radiole* next the hilum.—*Herbs or shrubs, with simple opposite or alternate leaves. Flowers small, often surrounded by coloured scales in heads, spikes or panicles often of distinct sexes.*

GENERA.

Flowers monœcious AMARANTHUS, v. 3. p. 1197.

ORDER LXX. CHENOPODIACEÆ.—LIND.

Perianth single, free, five-partite, imbricated in æstivation, persistent. *Stamens* inserted into the base of the perianth, and equal to the number of its segments. *Ovary* single, superior, or occasionally adhering to the tube of the perianth. *Style* one or many. *Stigmas* undivided. *Fruit* indehiscent, membranous, sometimes baccate. *Embryo* curled round farinaceous albumen. *Radiole* inferior.—*Herbaceous plants or undershrubs, with simple alternate leaves, without stipules. Flowers small, greenish, sometimes polygamous.*

GENERA

Flowers perfect, with stamens and pistils.

Stamens one or two SALICORNIA, v. 1. p. 1.

Stamens five, rarely three or four.

Perianth scales furnished with appendages at the back SALSOLA, v. 1. p. 428.

Perianth scales without appendages at the back.

Fruit loose in the closed perianth CHENOPodium, v. 1. p. 418.

Fruit adhering to the base of the perianth BETULA, v. 1. p. 427.

Flowers polygamous or monœcious,

female perianth two-partite ATRIPLEX, v. 3. p. 1297.

ORDER LXXI. POLYGONEÆ.—JUSS.

Perianth single, persistent, inferior, deeply divided, imbricated in aestivation. *Stamens* definite, inserted into the base of the perianth. *Anthers* two celled, bursting lengthwise. *Ovary* superior. *Styles* or *stigmas* numerous. *Fruit* usually a triangular nut, one seeded, naked, or more or less covered by the perianth. *Seeds* with farinaceous albumen. *Embryo* generally lateral, sometimes central, often curved. *Radicle* distant from the hilum.—*Herbaceous plants, rarely shrubs. Leaves* alternate with stipules, forming a sheath round the stem in the form of an ochrea, when young rolled backwards. *Flowers* occasionally unisexual, often in racemes.

GENERA.

Perianth four parted..... OXYRIA, v. 2. p. 517.

Perianth five parted POLYGONUM, v. 2. p. 568.

Perianth six parted RUMEX, v. 2. p. 518.

ORDER LXXII. ELÆAGNEÆ.—BROWN.

Flowers diœcious, rarely perfect. *Male flowers* with a single four-partite perianth. *Stamens* three, four or eight, sessile. *Anthers* two celled. *Female flowers* with a single tubular inferior perianth, persistent, the limb entire, or two to four toothed. *Ovary* superior, simple, one celled, containing a solitary ascending stalked ovule. *Style* very short. *Stigma* simple, subulate, glandular. *Fruit* crustaceous, covered with the perianth, becoming succulent. *Seed* erect. *Embryo* straight, surrounded by very thin fleshy albumen. *Radicle* short, inferior. *Cotyledons* fleshy.—*Trees or shrubs, with entire exstipulate leaves. Flowers* axillary, often fragrant.

GENERA.

Barren flowers amentaceous, tetrandrous. HIPPOPHAE, v. 3. p. 1280.

ORDER LXXIII. THYMELEÆ.—JUSS.

Perianth single, inferior, tubular, coloured, limb four, rarely five-cleft, imbricated in æstivation. *Stamens* definite, inserted in the mouth of the tube, usually double the number of the segments of the perianth. *Authers* two celled, bursting lengthwise in the middle. *Ovary* solitary, with a single pendulous ovule. *Style* single, often lateral. *Stigma* undivided. *Fruit* hard, dry, nut-like, or drupaceous. *Albumen* none, or thin, fleshy. *Embryo* straight. *Cotyledons* plano-convex. *Radiole* short, superior.—*Shrubs with simple entire exstipulate leaves.*

GENERA.

Perianth four lobed. *Stamens* eight..... DAPHNE, v. 2. p. 565.

ORDER LXXIV. SANTALACEÆ.—BROWN.

Perianth single, superior, four or five cleft, somewhat coloured, valvate in æstivation. *Stamens* four or five, opposite the segments of the perianth, and inserted into their base. *Ovary* one celled, containing two to four ovules, pendulous, attached to the top of the central placenta. *Style* one. *Stigma* often lobed. *Fruit* one seeded, hard and dry, or drupaceous. *Albumen* fleshy. *Embryo* in the axis inverted, taper.—*Trees, shrubs, or herbaceous plants, with alternate or nearly opposite leaves, undivided, exstipulate. Flowers small.*

GENERA.

Capsule one seeded, indehiscent, crowned
with the persistent perianth THESIUM, v. 1. p. 384.

ORDER LXXV. ARISTOLOCHIEÆ.—JUSS.

Flowers perfect. *Perianth* single, tubular, the limb either three lobed, or tubular, and irregularly dilated at the upper part, valvate in æstivation. *Stamens* definite, free and distinct, or adhering to the style and stigma. *Ovary* inferior, three to six celled. *Ovules* numerous. *Style* simple. *Stigma* divided into as many rays as there are cells in the ovary. *Fruit* dry or succulent, three or six celled, many seeded. *Seeds* horizontally attached to the lateral placentas. *Embryo* very small, placed in the base of fleshy albumen.—*Herbaceous plants or shrubs, often climbing, with alternate simple petiolate leaves.*

GENERA.

Perianth tubular, the limb dilated into a
ligula. *Stamens* inserted upon the
style, gynandrous ARISTOLOCHIA, v. 3. p. 1131.

Perianth campanulate, three lobed. Sta-
mens distinct..... ASARUM, v. 2. p. 674.

ORDER LXXVI. EMPETREÆ.—NUTT.

Flowers dioecious. *Perianth* single, free, hypogynous, imbricated scales. *Stamens* equal in number to the inner scales, and alternate with them. *Anthers* roundish, two celled, the cells distinct, bursting longitudinally. *Ovary* superior, seated on a fleshy disk, three, six, or nine celled. *Ovules* solitary, ascending. *Style* single. *Stigma* radiating, the rays as many as the cells of the ovary. *Fruit* fleshy, seated in the persistent calyx, three, six, or nine celled, the coat of the cells bony. *Seeds* solitary, ascending. *Embryo* taper in the axis of the albumen. *Radicle* inferior.—*Small undershrubs, with heath-like evergreen leaves, without stipules, and flowers minute in their axis.*

GENERA.

Perianth of six pieces, in two rows. Sta-
mens three..... EMPETRUM, v. 3. p. 1276.

ORDER LXXVII. EUPHORBIACÆ.—JUSS.

Flowers monœcious or dioecious. Male and female flowers in the same heads, and surrounded by a monopetalous five-cleft involucre, the segments being entire, or ciliated, outside of which are five glands, alternating with the primary segments. *Male flowers* numerous, the *stamens* definite or indefinite, distinct or monodelphous. *Anthers* two celled. *Female flowers* solitary, central, without a perianth. *Ovary* superior, sessile, or stalked, two, three, or more celled. *Styles* equal in number to the cells, sometimes distinct, sometimes combined, sometimes wanting. *Stigmas* three, usually bifurcate. *Fruit* generally three celled, the valves dehiscing with elasticity from the common axis. *Seeds* solitary, or twice suspended with an arillus. *Embryo* enclosed in fleshy albumen. *Cotyledons* flat. *Radicle* superior.—*Trees, shrubs, or herbaceous plants, often abounding in acrid milky juice. Leaves simple, rarely compound, mostly without stipules. Flowers axillary or terminal, with bracts, or with an involucre.*

GENERA.

Capsule three celled.

Stamens four..... BUXUS, v. 3. p. 1190

Stamens ten to thirty-six..... EUPHORBIA, v. 3. p. 1132.

Capsule two celled MERCURIALIS, v. 3. p. 1291.

ORDER LXXVIII. URTICACEÆ.—ENDLICH.

Flowers small, green, monœcious or diœcious, solitary or clustered, or in catkins or close heads, surrounded by an involucre. *Perianth* membranous, inferior, lobed, persistent. *Stamens* definite, distinct, inserted into the base of the perianth, and opposite its lobes. *Anthers* curved inwards in æstivation, turning backwards with elasticity when bursting. *Ovary* simple, free, superior. *Styles* two or one. *Stigma* simple. *Fruit* a simple indehiscent nut, surrounded by the persistent membranous or fleshy perianth, or inserted into a fleshy receptacle, which is dilated, and often concave. *Seed* erect, or pendulous, with or without albumen. *Embryo* straight, curved, or spiral. *Cotyledons* flat. *Radicle* always pointing to the hilum.—*Trees, shrubs, or herbs. Leaves* alternate, usually covered with asperities or stinging hairs.

GENERA.

Herbaceous plants.

Perianth of the fertile flowers four-partite *PARIETARIA*, v. 1. p. 199.

Perianth of the fertile flowers two

valved..... *URTICA*, v. 3. p. 1192.

Climbing shrub..... *HUMULUS*, v. 3. p. 1282.

ORDER LXXXIX. ULMACEÆ.—MIRBEL.

Perianth single. *Flowers* perfect, or polygamous, never in catkins. *Perianth* inferior, irregular, divided, campanulate. *Stamens* three to six, inserted into the base of the perianth, erect in æstivation. *Ovary* superior, two celled. *Stigmas* two, distinct. *Fruit* one or two celled, indehiscent, membranous or drupaceous. *Seeds* solitary, pendulous. *Albumen* none, or in very small quantity. *Embryo* straight, or curved with foliaceous cotyledons. *Radicle* superior.—*Trees and shrubs, with simple scabrous alternate deciduous leaves and stipules.*

GENERA.

Capsules compressed, winged all round... *ULMUS*, v. 1. p. 431.

ORDER LXXX. BETULINEÆ.—RICH.

Flowers monœcious, amentaceous. *Perianth* free, campanulate, four or five lobed. *Stamens* distinct, four to twelve, free, inserted into the base of the perianth, and the same number as its lobes, or double or treble that number. *Anthers* two celled. *Ovary* superior, two celled. *Style* single, or none. *Stigmas* two. *Fruit* membranous, indehiscent by abortion, one celled. *Seed* pendulous, naked.

Albumen none. *Embryo* straight. *Radicle* superior.—*Trees or shrubs* *Leaves* alternate, simple. *Stipules* deciduous.

GENERA.

- Female catkin elongato-cylindrical, nut
 one celled BETULA, v. 3. p. 1216.
 Female catkin ovato-globose, nut two
 celled ALNUS, v. 3. p. 1194.

ORDER LXXXI. CUPULIFERÆ.—RICH.

Flowers monœcious, males amentaceous, females aggregate, or amentaceous. *Male flowers.* *Stamens* five to twenty, inserted into the base of the scales, or of a membranous perianth, generally distinct. *Female flowers.* Ovaries crowned with the rudiments of a superior perianth, seated within a coriaceous involucre (cupule) of various figure, and with several cells and several ovules, the greater part of which are abortive. *Stigmas* several sub-sessile, distinct. *Fruit* a bony or coriaceous one celled nut, more or less enclosed in the involucre. *Seeds* one, two, or three, pendulous. *Embryo* large, with plano-convex fleshy cotyledons, and a minute superior radicle.—*Trees or shrubs, with alternate simple leaves, and deciduous stipules.*

GENERA.

- Stigmas* two in each flower.
 Fruit surrounded by an involucre.
 Involucre coriaceous, with a lacerated
 margin CORYLUS, v. 3. p. 1214.
 Involucre scale shaped, three lobed CARPINUS, v. 3. p. 1215.
Stigmas three to six in each flower.
 Involucre closed over the nuts, hispid.
 Styles three FAGUS, v. 3. p. 1212.
 Styles six CASTANEA, v. 3. p. 1210.
 Involucre not closed, cup-shaped,
 rarely hispid QUERCUS, v. 3. p. 1205

ORDER LXXXII. MYRICEÆ.—RICH.

Flowers monœcious, amentaceous. *Male flowers.* Perianth two scales, with six, rarely eight. *Stamens* somewhat monadelphous. *Anthers* two or four celled, bursting lengthwise. *Female flowers* a one celled ovary, surrounded by several hypogynous scales. *Stigmas* two, subulate, or dilated and petaloid. *Fruit* drupaceous, often covered with waxy secretions, and with the scales of the perianth becoming fleshy and adherent, or dry and dehiscent, with the scales

distinct. *Seed* solitary, erect. *Embryo* without albumen. *Cotyledons* plano-convex. *Radicle* short, superior.—*Shrubs* furnished with glands, secreting a resinous juice. *Leaves* alternate, simple, with or without stipules.

GENERA.

Catkins ovate, with lunate scales MYRICA, v. 3. p. 1281.

ORDER LXXXIII. SALICINÆ.—RICH.

Flowers either monœcious or diœcious, amentaceous. *Male flowers* disposed in a cylindrical catkin. Perianth small, having the appearance of a gland. *Stamens* two to thirty, distinct, or monadelphous. *Anthers* two celled. *Female flowers* in a more dense ovate or cylindrical catkin, perianth simple, often persistent. *Ovary* one celled. *Style* simple. *Stigmas* two, often bifid. *Capsule* one celled, two valved, the cells many seeded, small, pendulous, exalbuminous, entirely covered with silky or cottony down, or only downy at the apex. *Embryo* erect, *Radicle* inferior.—*Trees or shrubs, with alternate simple leaves. Stipules often leafy, deciduous, or persistent.*

GENERA.

Stamens two to five SALIX, v. 3. p. 1227.

Stamens eight to thirty..... POPULUS, v. 3. p. 1285.

ORDER LXXXIV. CONIFERÆ.—JUSS.

Flowers monœcious or diœcious, disposed in a catkin. *Male flowers*, scales numerous, variously arranged, either covering or supporting, the anthers. *Anthers* one, or several united, two or many lobed, bursting outwardly, often terminated by a scale-like crest. *Female flowers* in cones. *Ovary* spread open, and having the appearance of a flat scale, destitute of style or stigma, and arising from the axis of a membranous bract. *Ovule* naked, in pairs on the face of the ovary, having an inverted position, and consisting of one or two membranes, open at the apex, and of a nucleus. *Fruit* consisting of a cone, formed of the scale-shaped ovaries, becoming enlarged and indurated. *Seed* with a hard crustaceous integument. *Embryo* in the midst of fleshy oily albumen, with two or many opposite cotyledons. *Radicle* next the apex of the seed, and having an organic connexion with the albumen.—*Trees or shrubs, abounding in resinous secretions. Leaves linear, acerose, or lanceolate, entire at the margins, sometimes fascioled, persistent.*

GENERA.

Anthers two in each floret, scale of the

cones woody PINUS, v. 3. p. 1222.

- Anthers four to seven in each floret, scales
of the catkin becoming fleshy JUNIPERUS, v. 3. p. 1293.
Anthers eight to ten, peltate. Fruit sur-
rounded with a fleshy disk TAXUS, v. 3. p. 1294.

SUB-CLASS II.

MONOCOTYLEDONES, OR ENDOGENEOUS PLANTS.

1. FLORIDÆ.

Floral envelopes whorled.

ORDER LXXXV. HYDROCHARIDÆ.—DE CAND.

Flowers dioecious, enclosed in a spathe of three pieces. *Male flowers*, one or more, sessile or pedunculated. *Female flowers* single, sessile. *Perianth* six-partite, the outer ones herbaceous, the inner petaloid. *Stamens* definite or indefinite. *Ovary* single, free, inferior, one or many celled. *Stigmas* three to six. *Fruit* dry, or succulent, indehiscent, one or many celled. *Seeds* indefinite, often parietal, without albumen. *Embryo* undivided.—*Aquatic herbaceous plants. Leaves with parallel veins, sometimes spiny. Flowers spatheaceous.*

GENERA.

- The outer perianth divided to the base ... HYDROCHARIS, v. 3. p. 1292.
The outer perianth tubular..... STRATIOTES, v. 2. p. 776.

ORDER LXXXVI. ORCHIDÆ.—JUSS.

Perianth superior, ringent. *Sepals* three, usually coloured, of which the odd one is uppermost, in consequence of a twisting of the ovary. *Petals* three, or two, sometimes absent, mostly coloured, two of which are uppermost, and one called the *lip* undermost, which is frequently lobed, of a different form from the others, and often spurred at the base. *Stamens* three, united in a central column, the two lateral ones abortive, the central perfect, or the central abortive, and the two lateral ones perfect. *Anthers* two, four, or eight celled,

either persistent or deciduous. *Pollen* either powdery or cohering in definite or indefinite waxy masses, either constantly adhering to a gland or becoming loose in their cells. *Ovary* one celled, with three parietal placentas. *Style* forming part of the column of the stamens. *Stigma* a viscid space in front of the column. "Impregnation taking effect by absorption from the pollen masses through the gland in the stigmatic canal." *Capsule* inferior, bursting with three valves and three ribs. *Seeds* very numerous, attached to three parietal placentas, testa loose, reticulated, contracted at each end. *Embryo* a solid undivided fleshy mass. *Albumen* wanting.—*Herbaceous plants*. *Roots* either fasciculated or tuberous, the tubers being ovate, entire, or palmated. *Stem* rarely divided. *Leaves* simple, entire, amplexicaul, and often articulated with the stem. *Flowers* in terminal or radical spikes, racemes or panicles sometimes solitary, bracteated, and having all the parts inverted, in consequence of the twisting of the ovary.

TRIBES.

- Pollen masses stalked, of an indefinite number of cohering grains, enclosed in a pouch 1. OPHRYDEÆ.
- Pollen masses not stalked, simple, consisting of granules in a slight state of cohesion. Anthers parallel with the stigma 2. NEOTTIEÆ.
- Pollen masses not stalked, simple, consisting of granules in a slight state of cohesion. Anthers terminated like a lid, persistent 3. ARTHUSEÆ.
- Pollen cohering in grains or masses, which are definite in number, and waxy 4. MALAXIDÆ.
- Lateral anthers fertile, the intermediate one sterile and petaloid 5. CYPRIPEDEÆ.

GENERA.

TRIBE 1. OPHRYDEÆ.

Lip spurred at the base.

Glands of the pollen masses enclosed in a pouch ORCHIS, v. 3. p. 1103.

Glands of the pollen masses naked.

Pollen masses approximated GYMNADENIA, v. 3. p. 1111.

Pollen masses distant from each other HABENARIA, v. 3. p. 1112.

Lip not spurred at the base.

Glands of the pollen masses enclosed in a pouch.

Pouch single, enclosing both pollen masses ACERAS, v. 3. p. 1114.

- Pouch double, each enclosing a
single pollen mass..... OPHRYS, v. 3. p. 1116.
Glands of the pollen masses naked,
distinct HERMINIUM, v. 3. p. 1115.

TRIBE 2. NEOTTIÆ.

- Lip entire.
Remarkably concave GOODYERA, v. 3. p. 1119.
With two fleshy projections at the base. SPIRANTHES, v. 3. p. 1121.
Lip lobed.
Anthers naked, terminal, free NEOTTIA, v. 3. p. 1120.
Anthers covered with a hood LISTERA, v. 3. p. 1122.

TRIBE 3. ARTHUSEÆ.

- Lip not spurred at the base..... EPIPACTIS, v. 3. p. 1123.
Lip spurred at the base CORALLORHIZA, v. 3. p. 1127

TRIBE 4. MALAXIDÆ.

- Lip uppermost, much smaller than the
sepals MALAXIS, v. 3. p. 1128.
Lip undermost, much larger than the
sepals LIPARIS, v. 3. p. 1129.

TRIBE 5. CYPRIPEDIÆ.

- Lip very large, inflated..... CYPRIPEDIUM, v. 3. p. 1130.

ORDER LXXXVII. IRIDEÆ.—JUSS.

Perianth six partite, petaloid, tubular at the base, or separate, sometimes irregular, superior. *Stamens* three, inserted into the base of the outer segments of the perianth. *Anthers* two celled, fixed at the base, bursting lengthwise. *Ovary* three celled. *Style* one. *Stigmas* three, often petaloid, sometimes two lipped, simple, or lacinated. *Capsules* three celled, three valved, the valves septiferous in the middle, many seeded, the seeds attached to the inner angle of the cells, sometimes to a central column. *Embryo* enclosed within the corneous or fleshy albumen—*Herbaceous plants, or very seldom undershrubs, with tuberous or fibrous roots. Leaves alternate, ensiform, or linear equitant. Inflorescence terminal. Bracts spathaceous, often scarious.*

GENERA.

- Stigmas petaloid, three parted..... IRIS, v. 1. p. 43.
Stigmas not petaloid.
Three, bifid, with slender lobes TRICHONEMA, v. 1. 42.
Three, dilated upwards CROCUS, v. 1. p. 39.
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ORDER LXXXVIII. ARMARYLLIDÆ.—BROWN.

Perianth tubular, six-partite, imbricated in æstivation, superior, regular. *Stamens* six, arising from the segments of the perianth. *Filaments* free, or united. *Anthers* bursting inwards. *Ovary* inferior, three celled. *Style* single. *Stigma* three lobed. *Fruit* either a three celled three valved capsule, the valves septiferous in the middle, many seeded, or a one to three seeded berry. *Seeds* with fleshy or horny albumen. *Embryo* straight, with its radicle turned towards the hilum.—*Generally bulbous, sometimes fibrous rooted plants. Leaves ensiform, with parallel veins. Flowers usually with spathaceous bracts.*

GENERA.

- Perianth* funnel-shaped, its mouth sur-
rounded with a petaloid crown NARCISSUS, v. 2. p. 467.
Perianth in six segments, the inner ones
short, notched GALANTHUS, v. 2. p. 466.
Perianth with a short tube, the limb six-
cleft, equal..... LEUCOCYUM, v. 2. p. 465

ORDER LXXXIX. DIOSCOREÆ.—BROWN.

Flowers dioecious. *Perianth* superior, six-partite. *Male flowers* with six stamens, inserted into the base of the perianth. *Female flowers. Ovary* three celled. *Style* deeply divided. *Stigmas* undivided. *Fruit* leafy, compressed, with two of its cells abortive, occasionally succulent, cell one or two seeded. *Seeds* flat, compressed. *Embryo* small near the hilum, lying in a large cavity of cartilaginous albumen.—*Twining shrubs. Leaves with netted veins. Flowers small, spiked, with from one to three bracts each.*

GENERA.

- Perianth* campanulate TAMUS, v. 3. p. 1284.

ORDER XC. LILIACÆ.—LIND.

Perianth single, regular, coloured, its segments occasionally cohering in a tube. *Stamens* six, inserted into the segments of the perianth. *Anthers* opening inwards. *Ovary* superior, three celled, many seeded. *Style* one. *Stigma* simple, or three lobed. *Fruit* succulent, or dry and capsular, three celled. *Seeds* packed one upon another in one or two rows. *Embryo* with the same direction as the seed in the axis of fleshy albumen, or uncertain in direction and position.—*Root fibrous, or fasciculated. Stem none, except a bulb, or tuberous, or creeping, or erect, or arborescent. Leaves with parallel*

veins, membranous, not articulated, with the stem either sessile or with a narrow leafy petiole.

TRIBES.

Bulbous.

Perianth segments scarcely adhering into a tube. Seed coat soft and pale 1. *TULIPÆÆ*.

Perianth segments united in a tube, or spreading. Seed coat black and brittle..... 2. *SCILLÆÆ*.

Not bulbous.

Stem, if developed, erect. Root fascicled, or fibrous 3. *ANTHERICÆÆ*.

Stem developed, as a rhizoma or tuber. 4. *CONVALLARINÆÆ*.

Stem usually fully developed, often arborescent, branched, or twining ... 5. *ASPARAGÆÆ*.

GENERA.

1. *TULIPÆÆ*.

Perianth segments with nectariferous glands at the base..... *FRIILLARIA*, v. 2. p. 490.

Perianth segments without nectariferous glands at the base.

Flower solitary, terminal *TULIPA*, v. 2. v. 488.

Flowers several, terminal..... *GAGEA*, v. 2. p. 481.

2. *SCILLÆÆ*.

Perianth campanulate *HYACINTHUS*, v. 2. p. 470.

Perianth globose, or sub-cylindrical *MUSCARI*, v. 2. p. 470.

Perianth spreading.

Flowers in terminal umbels *ALLIUM*, v. 2. p. 482.

Flowers in a spike or raceme.

Filaments all thread-shaped *SCILLA*, v. 2. p. 477.

Filaments of the outer row dilated... *ORNITHOGALUM*, v. 2. p. 479.

3. *ANTHERICÆÆ*.

Perianth deciduous, with a nectariferous gland at the base *ANTHERICUM*, v. 2. p. 488.

Perianth persistent, glumaceous..... *NARTHECIUM*, v. 2. p. 492.

4. *CONVALLARINÆÆ*.

Perianth campanulate, or tubular. Fruit a berry *CONVALLARIA*, v. 2. p. 471.

5. *ASPARAGÆÆ*.

Flowers perfect (containing stamens and stigma) *ASPARAGUS*, v. 2. p. 475.

Flowers unisexual..... *RUSCUS*, v. 3. p. 1277.

ORDER XCI. MELANTHACEÆ.—BROWN.

Perianth inferior, coloured in six pieces, or united at the base into a tube, the segments generally involute in æstivation. *Stamens* six. *Anthers* mostly turned outwards. *Ovary* three celled, many seeded. *Style* trifid, or three parted. *Stigmas* undivided. *Capsule* generally divisible into three pieces, sometimes with a loculicidal dehiscence. *Seeds* with a membranous testa. *Albumen* dense, fleshy.—*Herbs* with fibrous or fascioled roots. *Rhizoma* sometimes fleshy. *Leaves* sheathing at the base, with parallel veins. *Flowers* either rising from under the surface of the ground, or arranged upon tall leafy stems in large panicles, or disposed in spikes or racemes upon a naked scape.

GENERA.

Perianth funnel-shaped, with a very long
tube COLCHICUM, v. 2. p. 533.
Perianth of six pieces, spreading..... TOFIELDIA, v. 2. p. 532.

ORDER XCII. RESTIACEÆ.—BROWN.

Perianth inferior, two to six parted, seldom wanting. *Stamens* two to six, when they are from two to three in number and attached to a perianth of four or six divisions they are then opposite the inner segments. *Anthers* usually one celled. *Ovary* one or more celled, cells single seeded, pendulous. *Fruit* capsular, or nut-like. *Seed* inverted. *Albumen* of the same figure as the seed. *Embryo* lenticular on the outside of the albumen at the end of the seed, which is most remote from the hilum.—*Herbaceous plants* or undershrubs. *Leaves* simple, narrow, or none. *Culm* naked, or more usually protected by sheaths, which are slit, and have equitant margins. *Flowers* generally aggregate, in spikes or heads, separated by bracts, and most frequently unisexual.

GENERA.

Flowers capitate ERIOGONUM, v. 3. p. 1200.

ORDER XCIII. JUNCEÆ.—DE CAND.

Flowers perfect, or unisexual. *Perianth* free, inferior, six-partite, more or less glumaceous. *Stamens* six, inserted into the base of the segments, sometimes three, and these opposite the external segments. *Anthers* two celled. *Ovary* one or three celled, one or many seeded, or one celled and three seeded. *Style* single. *Stigmas* generally three, sometimes only one. *Fruit* capsular, with three valves, which have the dissepiment in their middle, sometimes destitute of valves, and one seeded by abortion. *Seeds* with the albumen

firm, fleshy or cartilaginous. *Embryo* within it.—*Herbaceous plants, with fascioled or fibrous roots, sheathing, fistular, or flat and channelled leaves.* * *Flowers brown or green, glutaceous, paniced, corymbose, or capitate.*

GENERA.

- Capsule three celled, three valved, many
seeded..... JUNCUS, v. 2. p. 493.
Capsule one celled, three valved, three
seeded..... LUZULA, v. 2. p. 510.

ORDER XCIV. ALISMACEÆ.—BROWN.

Perianth of six pieces, the three outer ones herbaceous, the three inner petaloid. *Stamens* definite or indefinite. *Ovaries* several superior, one celled. *Ovules* erect, or ascending, solitary, or two attached to the suture at a distance from each other. *Styles* and *stigmas* the same number as the ovaries. *Fruit* dry, indehiscent, one or two seeded. *Seeds* without albumen. *Embryo* incurved, undivided.—*Aquatic herbs, the leaves without parallel veins.*

GENERA.

Flowers perfect.

- Capsules about six, spreading in a
radiated manner ACTINOCARPUS, v. 2. p. 535.
Capsules numerous, clustered ALISMA, v. 2. p. 536.
Flowers monœcious. *Stamens* numerous SAGITTARIA, v. 3. p. 1221.

ORDER XCV. BUTOMACEÆ.—LIND.

Perianth of six pieces, coloured. *Stamens* hypogynous, definite or indefinite. *Ovaries* superior, three, six, or more either distinct or united into a single mass. *Stigmas* the same number as the ovaries, simple. *Fruit* many seeded, *follicles* either distinct and rostrate, or united in a single mass. *Seeds* minute, very numerous, attached to the whole of the inner surface of the fruit. *Albumen* none. *Embryo* with the same direction as the seed.—*Aquatic plants. Leaves very cellular, with parallel veins, often containing milky juice. Flowers in umbels, very handsome.*

GENERA.

- Stamens* nine BUTOMUS, v. 2. p. 583.

ORDER XCVI. JUNCAGINACEÆ.—LIND.

Perianth single, herbaceous, rarely absent. *Stamens* six. *Ovaries* three or six, superior, cohering firmly. *Ovules* one or two, approximated at the base, erect. *Fruit* dry, one or two seeded. *Seeds* erect. *Albumen* wanting. *Embryo* having the same direction as the seed, with a lateral cleft for the emission of the plumule.—*Herbaceous plants, growing in boggy places. Leaves ensiform, with parallel veins. Flowers inconspicuous, in spikes or racemes.*

GENERA.

Anthers elongated, upon very slender
filaments SCHEUCHZERIA, v. 2. p. 529.
Anthers nearly sessile TRIGLOCHIN v. 2. p. 530.

ORDER XCVII. ARACEÆ.—SCHOTT.

Flowers unisexual, arranged upon a spadix, within a spathe. *Perianth* wanting. *Males. Stamens* definite or indefinite, hypogynous, very short. *Anthers* one, two, or many celled, ovate, turned outwards. *Females. Ovary* superior, one very seldom three celled, and many seeded. *Ovules* erect or pendulous, or parietal. *Stigma* sessile. *Fruit* succulent. *Seeds* pulpy. *Embryo* in the axis of fleshy or mealy albumen, straight, taper, with a cleft on one side, in which the plumule lies. *Albumen* sometimes wanting.—*Herbaceous plants, frequently with a fleshy cormus, or shrubs, stemless, or arborescent, or climbing by means of aerial roots. Leaves sheathing at the base, convolute in the bud, spadix generally enclosed in a spathe.*

GENERA.

Spatha of one leaf, convolute at the base.
Perianth wanting. *Anther* solitary,
two celled. *Fruit* a berry ARUM, v. 3. p. 1202.

ORDER XCVIII. TYPHACEÆ.—DE CAND.

Flowers unisexual, arranged upon a naked spadix. *Sepals* three or more, sometimes a mere bundle of hairs. *Petals* wanting. *Males. Stamens* three or six. *Anthers* wedge-shaped, attached by their base to long filaments, which are sometimes monadelphous. *Females. Ovary* single, superior, one celled. *Ovule* solitary, pendulous. *Style* short. *Stigmas* one or two, simple, linear. *Fruit* dry, indehiscent, one celled, one seeded. *Embryo* in the centre of albumen, straight, taper, with a cleft on one side, in which the plumule lies. *Radicle* next the hilum — *Herbaceous plants, growing in marshes or ditches. Stems without nodi. Leaves rigid, ensiform, with parallel veins. Spadix without spathe.*

GENERA.

Flowers in cylindrical spikes *TYPHA*, v. 3. p. 1150.

Flowers in dense globose heads *SPARGANIUM*, v. 3. p. 1148.

ORDER XCIX. FLUVIALES.—VENT.

Flowers perfect, or unisexual. *Perianth* of two or four pieces, often deciduous, rarely wanting. *Stamens* definite, hypogynous. *Ovaries* superior, one or more. *Stigma* simple. *Ovule* solitary, pendulous. *Fruit* dry, indehiscent, one celled, single seeded. *Seed* pendulous. *Albumen* wanting. *Embryo* with a lateral cleft, for the emission of the plumule. *Aquatic plants*. *Leaves* very cellular, with parallel veins. *Flowers* small, usually arranged in terminal spikes.

GENERA.

Flowers concealed in the base of the
leaves *ZOSTERA*, v. 3. p. 1147.

Flowers not concealed in the base of the
leaves.

Flowers perfect.

Perianth of four segments *POTAMOGETON*, v. 1. p. 207.

Perianth wanting, or of two seg-
ments *RUPPIA*, v. 1. p. 214.

Flowers imperfect. Stamen one *ZANNICHELLIA*, v. 3. p. 1146.

ORDER C. PISTIACEÆ.—RICH.

Flowers two, naked, enclosed in a spatha. *Male*. *Stamens* definite. *Female*. *Ovary* one celled, with one or more erect ovules. *Style* short. *Stigma* simple. *Fruit* membranous, or capsular, indehiscent, one or more seeded. *Seeds* with a fungous testa, and a thickened indurated foramen. *Embryo* either in the axis of fleshy albumen, and having a lateral cleft for the emission of the plumule, or at the axis of the nucleus.—*Floating plants*, composed of lenticular compressed fronds or leaves. *Flowers* from the borders of the frond.

GENERA.

Perianth wanting *LEMNA*, v. 1. p. 29.

2. GLUMACEÆ.

Floral envelopes imbricated.

ORDER CI. GRAMINEÆ.—BROWN.

Flowers generally perfect, sometimes monocious or polygamous consisting of imbricated bracteas, of which the outer ones are called *glumes*, the interior immediately enclosing the stamens, *paleæ* or *glumellæ*, and the innermost at the base of the ovarium *scalæ* or *glumellules*. *Glumes* generally two, alternate and unequal. *Glumelles* two, alternate, the lower or outer one simple, the upper or inner composed of two, united by their contiguous margins, and generally with two keels. *Glumellules* two, rarely three, sometimes very small or wanting. *Stamens* generally three, rarely one, two, or six. *Filaments* generally free. *Anthers* versatile, two celled, bifid at the base and apex, bursting longitudinally. *Ovary* simple. *Styles* generally two, sometimes united at the base. *Stigmas* feathery or hairy. *Fruit* free, or attached to the glumes. *Pericarp* membranous, usually undistinguishable from the seed. *Albumen* farinaceous. *Embryo* lying on one side of the albumen at the base, lenticular, with a broad *cotyledon*, and a developed plumula; occasionally there is a second cotyledon smaller, and alternate with the usual one. *Roots* fibrous. *Rhizoma* often creeping, or bulbous. *Stem (culm)* generally fistular, closed at the joints, rarely solid, and covered with a coat of *silex*. *Leaves* alternate from the joints, with a divided sheath. *Flowers* collected into small spikelets, and arranged at the apex of the stem in panicles, racemes, or spikes, sometimes immersed in the thickened rachis, or enclosed in a spathe.

TRIBES.

Inflorescence a loose or close spike-like panicle.

Spikelets laterally compressed, one or two flowered.

Barren flowers one or two below the perfect one..... 1. PHALARIDÆ.

Barren flowers rudimentary above the perfect one.

Florets enveloped in long silky hairs 1. ARUNDINÆ.

Florets not enveloped in long silky hairs.

Inflorescence a spike-like panicle 3. PHELINEÆ.

Inflorescence a loose panicle.

Florets with a short awn, or wanting 4. AGROSTIDÆ.

Florets with a very long awn. 5. STIPACÆ.

- Spikelets laterally compressed, many
flowered, without hairs, awn
simple..... 6. *SESLERIÆ*.
- Spikelets with two or more flowers, the
upper ones often barren.
Glumes as long (or nearly) as the
spikelet 7. *AVENINÆ*.
Glumes shorter than the lowest floret 8. *FESTUCINÆ*.
- Inflorescence imbricated or two sided
spikes.
Spikelets solitary, or two or three
together, sessile, on opposite
sides of a channeled and toothed
rachis 9. *HORDEINÆ*.
- Spikelets of one perfect flower, placed
edgewise on the rachis..... 10. *ROTTBOELLINÆ*.
- Inflorescence in one sided spikes.
Spikelets dorsally compressed..... 11. *PANICÆ*.
Spikelets laterally compressed..... 12. *CHLORIDÆ*.

GENERA.

TRIBE 1. PHALARIDÆ.

- Stamens two *ANTHOXANTHUM*, v. 1. p. 33.
Stamens three.
Glumes strongly keeled *PHALARIS*, v. 1. p. 78.
Glumes not strongly keeled..... *HIBROCHLOÆ*, v. 1. p. 108.

TRIBE 2. ARUNDINÆ.

- Inflorescence a close spiked panicle *AMMOPHILA*, v. 1. p. 80.
Inflorescence a loose spreading panicle.
Glumes longer than the florets *CALAMAGROSTIS*, v. 1. p. 89
Glumes shorter than the florets *ARUNDO*, v. 1. p. 147.

TRIBE 3. PHLEINÆ.

- Inflorescence a close spiked panicle.
Glumes simple, awnless *ALOPECURUS*, v. 1. p. 74.
Glumes keeled, and mostly terminating
in an awn *PHLEUM*, v. 1. p. 82.
Inflorescence a somewhat one sided
raceme *KNAPPIA*, v. 1. p. 51.

TRIBE 4. AGROSTIDÆ.

- Inflorescence a contracted spike-like
panicle.
Glumes swollen at the base..... *CASTRIDIUM*, v. 1. p. 81.
Glumes not swollen at the base *POLYPOGON*, v. 1. p. 87.

Inflorescence a loose or spreading panicle.

Glumes equal, obtuse MILIUM, v. 1. p. 81.

Glumes unequal, pointed or awned ... AGROSTIS, v. 1. p. 91.

TRIBE 5. STIFACEÆ.**Inflorescence an erect panicle, awn long,**

twisted STIPA, v. 1. p. 87.

TRIBE 6. SESLERIÆ.**Inflorescence a spike, outer glumelles**

jagged and awned at the apex..... SESLERIA, v. 1. p. 107.

TRIBE 7. AVENINÆ.**Inflorescence a racemose panicle, spike-**

lets many flowered TRIODIA, v. 1. p. 122.

Inflorescence a spike-like panicle, glumes

with a feathered awn LAGURUS, v. 1. p. 86.

Inflorescence mostly a loose panicle, spike-

lets two or three flowered.

Glumelles truncated and jagged, awn-

less CATABROSA, v. 1. p. 96.

Glumelles unequal, outer one two

pointed, awn from near the base... AIRA, v. 1. p. 96.

Glumelles nearly equal, outer one two

pointed, awn from the middle of
the back..... AVENA, v. 1. p. 138.

Glumelles nearly equal, outer one with

the awn from near the apex..... HOLCUS, v. 1. p. 102.

Glumelles nearly equal, lower florets

with the awn from near the base

and jointed, upper florets with the

awn from near the apex, straight. ARRHENATHERUM, v. 1. p. 104

TRIBE 8. FESTUCINÆ.**Flowers awnless.**

Glumes unequal at the base BRIZA, v. 1. p. 123.

Glume equal at the base.

Glumelles hardened on the fruit.

Glumes two, nearly equal in length,

about as long as the florets ... MELICA, v. 1. p. 109.

Glumes two, of unequal lengths,

much shorter than the florets. MOLINIA, v. 1. p. 110.

Glumelles not hardened on the fruit. POA, v. 1. p. 111.

Flowers awned.

Spikelets with a pectinated bractea at

the back..... CYNOSURUS, v. 1. p. 145.

Spikelets clustered, three or four flowered. DACTYLIS, v. 1. p. 144.

Spikelets not clustered, many flowered.

- Outer glumella awned below the bifid
 apex *BROMUS*, v. 1. p. 131.
 Outer glumella terminating in a point
 or awn *FESTUCA*, v. 1. p. 121.

TRIBE 9. HORDEINEÆ.

Glumes two.

- Spikelets two or three from the same
 point, two or three flowered..... *ELYMUS*, v. 1. p. 149.
 Spikelets single flowered, three to-
 gether, the lateral ones mostly
 imperfect *HORDEUM*, v. 1. p. 150.
 Spikelets many flowered, all perfect.
 Glumes nearly equal *TRITICUM*, v. 1. p. 154.
 Glumes unequal *BRACHYPODIUM*, v. 1. p. 160
 Glumes single *LOLIUM*, v. 1. p. 162.

TRIBE 10. ROTTBÖELLINÆ.

- Spikelets in two rows on one side of the
 rachis *NARDUS*, v. 1. p. 61.
 Spikelets imbedded alternately on oppo-
 site sides of the rachis *ROTTBÖELLIA*, v. 1. p. 165.

TRIBE 11. PANICEÆ.

- Spikes fingered, spikelets in two rows on
 one side of a flattened rachis *DIGITARIA*, v. 1. p. 169.
 Spikes compound, secund, spikelets on
 one side of a flattened rachis *PANICUM*, v. 1. p. 105.
 Spikes compound, cylindrical, spikelets
 surrounded by an involucre of
 bristles *SETARIA*, v. 1. p. 106.

TRIBE 12. CHLORIDEÆ.

- Spikes fingered, glumes nearly equal,
 spreading *CYNODON*, v. 1. p. 168.
 Spikes erect, glumes unequal, erect..... *SPARTINA*, v. 1. p. 167.

ORDER CII. CYPERACEÆ.—Juss.

Flowers glutinous, perfect, or monœcious, consisting of single imbricated *glumes*, very rarely enclosing other glumes, but frequently hypogynous setæ. *Stamens* hypogynous, generally three, rarely more or less numerous. *Filaments* capillary. *Anthors* fixed by their base, two celled. *Ovary* free, often surrounded at the base by the setæ. *Ovule* erect. *Style* single, bifid or trifid. *Stigmas* mostly undivided. *Fruit* a crustaceous or bony *nut*, generally triangular, or compressed, one seeded, indehiscent. *Albumen* of the same figure as the seed,

farinaceous. *Embryo* small, lenticular, undivided at the base of the albumen.—*Perennial herbs resembling grasses. Root fibrous. Stems three angled, or taper, mostly without joints. Leaves with entire sheaths.*

TRIBES.

Flowers perfect.

Glumes two ranked 1. CYPERÆ.

Glumes imbricated on all sides 2. SCIRPÆ.

Flowers monœcious.

Fruit completely inclosed in an urceolate perianth 3. CARICÆ.

Fruit inclosed in a membranous pouch. 4. ELYNÆ.

TRIBE 1. CYPERÆ.

Spikelets many flowered CYPERUS, v. 1. p. 44.

Spikelets two to four flowered..... SCHÆNUS, v. 1. p. 46.

TRIBE 2. SCIRPÆ.

Hypogynous setæ, various in number.

Setæ short.

Spikelets several, forming a terminal spike..... RHYNCHOSPORA, v. 1. p. 46.

Spikelets solitary, terminal ELEOCHARIS, v. 1. p. 52.

Setæ long, silky..... ERIOPHORON, v. 1. p. 56.

Hypogynous setæ, mostly present, sometimes wanting.

Spikelets arranged alternately in a distichous spike..... BLYSMUS, v. 1. p. 56.

Spikelets not in a distichous spike, mostly paniculated..... SCIRPUS, v. 1. p. 48.

Hypogynous setæ wanting.

Stamens two CLADIUM, v. 1. p. 32.

Stamens three ELIOGETON, v. 1. p. 54.

TRIBE 3. ELYNÆ.

Spikes aggregate KOBRESIA, v. 3. p. 1189.

TRIBE 4. CARICÆ.

Flowers in imbricated spikes CAREX, v. 3. p. 1151.

CLASS II.

CELLULARES.

SUB-CLASS III.

ACOTYLEDONES, OR CRYPTOGAMIC PLANTS.

ORDER CIII. FILICES.—Juss.

Leafy plants, producing a *rhizoma*, which creeps below or upon the surface of the ground, or rises into the air like the trunk of a tree, cylindrical, soft and cellular within, hard and fibrous externally, which is like a rind, and is formed by the united basis of the leaves. *Leaves* or *fronds* coiled up (*circinate*) in vernation, with annular ducts in the vascular tissue of their petioles, entire, lobed, or much divided, the veins dichotomous, occasionally furnished with ducts, and the cuticle with stomates. *Fructification* consisting of *thece*, or semi-transparent cases, arising from the veins upon the under surface of the leaves or from the margin, and called *sori*. *Thece* either pedicellated, with the pedicle passing round them in the form of an elastic ring, or sessile, and without a ring, either springing from beneath the cuticle, which they then force up in the form of a membrane, called an *indusium*, or from the actual surface of the leaf, and are naked. *Sporules* mostly triangular, arranged without order within the thecæ, very numerous. Sometimes the leaves are contracted about the thecæ, so as to assume the appearance of forming a part of the reproductive organs, and sometimes the place of the thecæ is supplied by the depauperated lobes of the leaves.

TRIBES.

Thecæ furnished with an elastic ring.

Thecæ attached in clusters to the back

of the frond 1. POLYPODIACEÆ.

Thecæ attached in a receptacle on the

margin of the frond 2. GLEICHENIACEÆ.

Thecæ two valved, without an elastic ring.

Thecæ reticulated and striated. Frond

circinate in vernation 3. OSMUNDACEÆ.

Thecæ not reticulated or striated.

Fronds straight in vernation 2. OPHIOGLOSSACEÆ.

GENERA.

TRIBE 1. POLYPODIACEÆ.

Sori naked (without an indusium).

Thecæ in elongate clusters CETERACH, v. 4.

Thecæ in circular clusters.

Sori mixed with capillary segments... WOODSIA, v. 4.

Sori without capillary segments.

Becoming confluent, and concealed by the revolute margin of the frond..... ALLOSORUS, v. 4.

Not becoming confluent or concealed..... POLYPODIUM, v. 4.

Sori covered by an indusium.

Indusium marginal or submarginal-sori oblong or linear.

Sori marginal..... PTERIS, v. 4.

Sori at the apex of the segments of the frond..... ADIANTUM, v. 4.

Sori a continuous line on each side of the mid-rib..... LOMARIA, v. 4.

Indusium not marginal.

Sori circular.

Indusium orbicular, or nearly so, attached by its centre only ... POLYSTICHUM, v. 4.

Indusium reniform LASTREA, v. 4.

Indusium inserted by a broad base, with the thecæ and containing them like a cup, its free margin ragged..... CISTOPTERIS, v. 4.

Sori elongate.

Indusium single, opening towards the mid-rib ASPLENIUM, v. 4.

Indusium double, opening along the centre of the sori SCOLOPENDRIUM, v. 4.

TRIBE 2. GLEICHENIACEÆ.

Receptacle of Sori furnished within an exerted bristle TRICHOMANES, v. 4.

Receptacle of Sori not furnished with a bristle like appendage HYMENOPHYLLUM, v. 4.

TRIBE 3. OSMUNDACEÆ.

Thecæ terminating the frond in spike-like clusters OSMUNDA, v. 4.

TRIBE 4. OPHIOGLOSSACEÆ.

Thecæ in a branched spike BOTRYCHIUM, v. 4.

Thecæ on a club-shaped spike..... OPHIOGLOSSUM, v. 4.

ORDER CIV. LYCOPODIACEÆ.—DE CAND.

Usually moss-like plants. *Stems* creeping, solid, vascular, or stemless. *Leaves* imbricated, mostly erect and subulate, the axis abounding in annular ducts. *Fructification* sessile, thecae in the axis of the leaves, or bracts, and then formed into a spike, thecae either bursting by distinct valves or indehiscent, and containing either minute powdery matter or sporules, marked at the apex with three minute radiating elevated ridges.

GENERA.

Thecae two or three valved, the former
containing fine powdery matter, the
latter a few large sporules.. LYCOPIDIUM, v. 4.

ORDER CV. MARSILEACEÆ.—BROWN.

Creeping plants. *Leaves* petiolate and divided (or petioles destitute of laminae), rolled up in vernation. *Fructification* inclosed in leathery involucre that are near the root of the plant, and contain the thecae (or conceptacles), which are of two kinds, one consisting of membranous sacs, moist and tumid, containing germinating sporules, the others membranous sacs, containing a gelatinous matter and numerous powdery grains.

GENERA.

Conceptacles enveloped by involucre,
formed by the dilated base of the
leaves ISOETES, v. 4.
Conceptacles naked, axillary PILULARIA, v. 4.

ORDER CVI. EQUISETACEÆ.—DE CAND.

Fructifications terminal, in cone-like spikes or catkins, consisting of peltate scales, on the underside of which are from four to seven involucre, which open longitudinally, and contain numerous globose bodies, enfolded by four filaments, club-shaped, and at their extremity highly hygrometrical.—*Rigid leafless branched plants, with striated fistulose stem and branches, in the cuticle of which silica is secreted, numerously jointed, with sheathing toothed articulations.*

GENERA.

The only genus of the order..... EQUISETUM, v. 4.

ORDER CVII. MUSCI.—JUSS.

Fructification of two kinds. *Axillary bodies* cylindrical, or fusiform sacs in the axis of the leaves, containing a multitude of spherical or

oval particles, which are emitted upon water being applied to them, *thecæ* or *capsules* urn-like cases, seated upon a setæ or stalk, covered in an early stage by a membranous calyptra, (which generally bursts regularly and transversely at the base, and rises up with most of the pedunculated and operculated capsules), closed by a lid or *operculum*, and the mouth is naked or furnished with a single or double row of cellular rigid processes or teeth, called the *peristome*, which are always some multiple of four, free, or variously combined, the centre of the thecæ usually has an axis or columella surrounded by numberless sporules. *Sporules* in germination producing confervoid filaments, which afterwards ramify, and form an axis of growth at the point of the ramifications.—*Plants of small size, erect or creeping, terrestrial or aquatic, of a more or less compactly cellular structure, having a distinct axis of growth. Leaves minute, imbricated, entire or serrated, or toothed, very rarely divided, reviving after being dried by the application of moisture.*

ORDER CVIII. HEPATICEÆ.—Juss.

Fructification mostly of two kinds; 1st, oblong, or mostly rounded and frequently shortly pedunculated reticulated bodies, containing a very minutely granulated substance, which escapes by an aperture, formed at the extremity; 2ndly, *Capsules* or thecæ, which in an early state are covered over with a *calyptra*, which is tipped with an apparent style, often surrounded by a *perianth* or *calyx*, at length bursting the calyptra irregularly, and rising on a peduncle, and opening at the extremity with two or four, or many valves, destitute of operculum, bearing within numerous *seeds*, mostly mixed with spiral *filaments*.—*Minute plants frondose or foliose, mostly of a loose cellular structure, and generally reviving after being dried by the application of moisture.*

ORDER CIX. CHARACEÆ.—Rich.

Fructification of two kinds; 1st, axillary, solitary, sessile, oval bodies, formed of a few short tubes, spirally twisted around a centre, invested with a pellucid membrane, crowned with fine lobes, containing a fine powder, which has the power of germinating; 2ndly, *Globules* of a reddish or orange colour, succulent, and containing minute filaments, surrounded by a pellucid covering, at length opening with several valves.—*Aquatic plants, consisting of stems, formed of parallel tubes, which are either transparent or encrusted with carbonate of lime, and of regular whorls of tubes, which may be considered either as leaves or branches.* The pellucid stems of these plants are highly interesting, as allowing the circulation of the sap in two currents to be seen passing spirally along them.

ORDER CX. LICHENES.—Juss.

Perennial plants often spreading over the surface of the earth, or rocks or trees in dry places, very variable in their form and texture, consisting of a *thallus*, in the form of a lobed and foliaceous or hard and crustaceous or leprous substance, sometimes it is erect, fruticulose, and branched, at others pendent, variously coloured, rarely green, the substance of the thallus is sometimes simply cellular, but generally it is composed of cortical and medullary layers, the former being simply cellular, the latter both cellular and filamentous. *Fructification* of two kinds. 1. *Sporules* lying in membranous tubes or *thece*, immersed in nuclei of the medullary substance, which burst through the cortical layer, mostly becoming of a different colour harder, and are in the form of little disks of various forms, and called *apothecia*; 2. cellules of the medullary layer of the thallus bursting through the cortical layer in the form of wart-like excrescences.

ORDER CXI. ALGÆ.—Juss.

Leafless aquatic plants, without any distinct axis of vegetation, frequently having an animal-like motion, and consisting either of simple vesicles, lying in mucus, or of articular filaments, or of lobed fronds, formed of uniform cellular tissue. *Fructification* either apparently wanting, or contained in the joints of the filaments, or deposited in the *thece* of various forms, size, and position, caused by dilatations of the substance of the frond. *Sporules* with no proper integument, in germination elongating in two opposite directions.—*Plants of a sub-pellucid texture, often beautifully cellular, or tubular, and of a bright red or pink colour, frequently green or brownish, after having been dried a considerable length of time, they will revive on immersion in water*

ORDER CXII. FUNGI.—Juss.

Plants consisting of a congeries of cellules, among which filaments are occasionally intermixed, increasing in size by addition to their inside, their outside undergoing no change after its first formation, always springing from organised and generally decayed or decaying substances. *Sporules* lying either loose among the tissue, or enclosed in membranous cases called *sporidia*.—*Plants varying extremely in substance and duration, generally soft and juicy, sometimes exceedingly hard, with or without a central gelatinous nucleus, or dry and powdery.*

GLOSSARY,

OR

DICTIONARY OF WORDS,

USED IN THE DESCRIPTION OF PLANTS; TO MANY OF WHICH
IS ADDED THE DERIVATION, IN ORDER TO ASSIST THE
STUDENT TO REMEMBER THEIR MEANING.

A.

A. in composition, signifies without, as **APHYLLUS**, without leaves; **ACAULIS**, without stem.

ABBREVIATE, (*abbreviare*, to shorten).

ABORTION, (*ab*, from *ortus*, birth), an imperfect developement or absence of any given organ, in the symmetry of the flower, capsule, &c.

ABNORMAL, (*ab*, from *norma*, form), any departure from the ordinary structure of the family or genus to which the plant belongs.

ABRUPTLY PINNATE, when the common leaf stalk is not terminated by either a leaflet or tendril.

ACAULIS, (*a* without *caulis* stem), stemless, or when the stem is very short.

ACCUMBENT, (*accumbo*, to lie down), prostrate, supine, when the radical lies upon the edge of the cotyledons, in the seeds of cruciferous plants.

ACEROSUS, needle-shaped.

ACHENIUM, a dry, hard, bony, one celled superior indehiscent fruit, as *Lithospermum*, *Borago*.

ACOTYLEDONES, (*a*, without *κοτυληδων*, a seed lobe). **Acotyledonous** plants, whose seeds or sporules are without seed lobes, or distinct axis of germination.

ACULEATUS, prickly, furnished with prickles, as the stem of a rose.

ACUMINATUS, gradually tapering to a point.

ACUTE, sharp pointed, terminating in a point, not tapering, nor abruptly pointed.

- ACUTE ANGULAR**, having sharp angles, as stems of many carices.
- ADNATE**, adhering to a thing, when the filament is attached to the back of the anther, it is said to be adnate.
- ADVENTITIOUS BUDS**, buds developed in any other part of the stem, than the ordinary one in the axis of the leaf.
- ÆQUILATERUS**, equal sided.
- ÆRUGINOUS**, a deep green, with a mixture of blue, verdigris.
- ESTIVATION**, (*æstiva*, summer quarters), the manner in which the leaves or buds lie folded together before opening.
- AKENIUM**, or **ACHENIUM**, (α , not, $\chi\alpha\iota\nu\alpha$, to open), a nut.
- AGGREGATUS**, clustered, collected in roundish or globose parcels, as the flowers of *Cuscuta*.
- ALÆ**, wings, the two lateral petals of leguminous flowers.
- ALATUS**, winged, a thin broad margin.
- ALBUMEN**, a substance interposed between the testa or covering of the seed and the embryo; it varies in degrees of hardness from fleshy to bony, or even stony, and sometimes is entirely wanting.
- ALBURNUM**, the colourless last formed layer of wood interposed between the old formed wood and the bark.
- ALTERNATE**, when leaves, &c., are so dispersed upon the stem that no two arise from precisely the same horizontal plane.
- ALVEOLATUS**, honey-combed, excavated in the manner of the cells of honey-comb.
- AMENTUM**, a *catkin*, flowers, without calyx or corolla, but sessile in the axis of a bract, crowded into a spike, and the whole inflorescence falling away together.
- AMPLEXICAUL**, (*amplexus* embracing, *caulis* stem), leaves clasping or embracing the stem with their bases.
- AMYLAEOUS**, having the property of starch.
- ANASTOMOSING**, the union of the veins of leaves at the points, where they come in contact with each other.
- ANGULAR**, projecting longitudinal angles, *obtuse angled* when the angles are rounded, *acute angled* when the angles are sharp.
- ANNUAL**, (*annuus*, a year), plants which continue only one year.
- ANNULATUS**, ringed, surrounded by elevated or depressed bands.
- ANTHER**, (*ανθηρος*, flowery), the essential part of the stamen, usually fixed upon a filament, and consists generally of two lobes or cells, separated or united, containing the *pollen*, which, when ripe, escapes through a fissure, closed by valves or by pores usually at the apex.
- APETALOUS**, (α , without *πεταλον*, a petal), flowers without corolla.
- APEX**, the summit, usually applied to anything terminating in a point.
- APOCARPOUS**, (*απο*, apart, *καρπος*, fruit), when the carpels are quite simple, and not united.
- APOTHECIA**, (*απο-θηκη*, storehouse, repository), shield-like cases, or cases of various forms, in which the reproductive organs of cryptogamic plants are contained.
- ARACHNOID**, when hairs are very long, and loosely entangled, resembling cobweb.
- ARBOR**, a tree.

- ANGUATUS**, curved, so as to represent the arc of a circle.
- APPRESSED**, or **ADPRESSED**, placed close upon something else, as hairs when close pressed to the surface of the plants.
- APPROXIMATED**, near together.
- ARBORESCENT**, having a tendency to become a tree.
- ARILLUS**, a process of the placenta, adhering to the seed, and sometimes enveloping it.
- ARISTATUS**, awned, the continuation of the mid-rib forming a point of various length.
- ARTICULATUS**, jointed, the place where one thing readily separates from another, or having the appearance of being united.
- ARROW-HEADED**, (*sagittatus*), pointed, with two spreading enlarged acute lobes at the base, like the head of an arrow.
- ASCENDING**, (*ascendens*), anything having an oblique base, but above pointed upwards.
- ASCI**, tubes in which the sporules of cryptogamic plants are contained when in the nucleus.
- ASPER**, rough, covered with hard short rigid points.
- ASSURGENS**, the same as ascending.
- ATTENUATUS**, tapering, gradually diminishing in breadth.
- AURICULATUS**, eared, having lobes at the base.
- AWL-SHAPED**, (*subulatus*), very narrow, tapering to a very fine point, from a broad base.
- AWN**, (*arista*), beard, the continuation of the mid-rib, chiefly applied to the bristle of the glumes of grasses.
- AXE-SHAPED**, (*dolabriformis*).
- AXIL**, the point where the base of the upper side of the leaf joins the stem.
- AXILLARY**, anything arising from the axil of the leaf.
- AXIS**, a line passing directly through the centre of anything.
- AXIS ASCENDING**, that part of the plant ascending from the point or axis when it begins to depart from the descending axis.
- AXIS DESCENDING**, that part of the plant which descends from the point or axis when the rest of the plant takes an ascending direction.

B.

- BACCA**, berry, a many celled, many seeded, inferior indehiscent pulpy fruit, the seeds at maturity becoming loose, and scattered in the substance of a pulp, as is seen in a Gooseberry.
- BACCATUS**, berried, having a juicy succulent texture.
- BARBATUS**, (*bearded*), tufts of long hairs.
- BARBS**, when hairs are forked at the apex with both the limbs hooked they are called barbs.
- BARK**, (*cortex*), is the external coating of the stem of Exogenous plants forming a kind of sheath to the wood, and from which it is readily separable at certain seasons of the year.
- BEAKED**, *rostratus*, terminating gradually in a hard, long straight point.
- BEARD**. See **AWN**.
- BEARDED**, (*barbatus*), tufts of long weak hairs growing from the surface, crowded or solitary.

- BELL-SHAPED**, (*campanulatus*), any organ having an inflated tube, which is gradually enlarged into a limb, as the corolla of the *Campanulas*.
- BELLING**, (*ventricosus*), swelling unequally on one side.
- BERRIED**, see *Baccatus*.
- BERRY**, see *Bacca*.
- BICORNIS**, two horned, when any organ is terminated with two processes resembling horns.
- BIDENTATE**, two toothed.
- BIFIDUS**, split in two, bifid.
- BIENNIAL**, when a plant requires two years to perfect its fruit, and then dies, it is called biennial.
- BIPARTITUS**, divided in two.
- BIPINNATE**, (*bipinnatus*), when the leaflets of a pinnate leaf become themselves pinnate, as the leaves of *Fumaria officinalis*.
- BISERRATED**, when teeth are themselves toothed.
- BITERMATE**, (*bitermatus*), when three secondary petioles proceed from the common petiole, and each bears three leaflets, as *Temperitoria Ostruthium*.
- BI-TRI-CRENATE**, crenate, twice or thrice.
- BI-VALVED**, two valved.
- BLADDERY**, (*inflatus*), thin, membranous, swollen equally all over, as if inflated with air, as the calyx of *Silene inflata*.
- BLUNT**, (*obtusus*), terminating gradually in a rounded end.
- BOAT-SHAPED**, (*navicularis*), having the figure of a minute boat, as the seed of *Phalaris canariensis*.
- BONY**, (*osseus*), hard and close texture, resembling bone, as the stone of a cherry.
- BORDERED**, (*limbatus*), when one colour is surrounded by an edging of another.
- BRACIS**, small leaves or scales, from the axis of which the flower is developed, or else all those leaves found upon the inflorescence, and situated between the true leaves and the calyx.
- BRANCHED**, (*ramosus*), divided into branches.
- BRANCHLETS**, small branches.
- BRISTLE POINTED**, (*setosus*), terminating gradually in a very fine point.
- BRISTLES**, (*setae*), short stiff hairs.
- BULB**, a scaly body, formed at or beneath the surface of the ground, emitting roots from its base, and producing a stem from its centre.

C.

- CADUCOUS**, (*caducuo*), falling off very early, as the leaves of some Caeti and calyx of Poppy.
- CÆRULEUS**, sky blue.
- CÆSIOUS**, (*cæsius*), covered with a fine greenish bloom, grey.
- CÆSPITOSE**, (*cæspitosus*), growing in dense tufts, or patches.
- CALCAR**, spur, when a petal is lengthened at the base into a tube.
- CALCAREOUS**, chalky or limy.

- CALYPTER**, an extinguisher, a membranous covering to the thecae of mosses, which is called *myriiform* when it is equally torn all round at the base, and *dimidiate* when it is torn up on one side.
- CALYCIFLOREÆ**, those orders of flowers having the stamens and petals adhering to the calyx.
- CALYX**, the outer covering of the flower, which consists of several pieces, mostly of a green colour, and are either distinct or united by their margins into a tube of greater or less length.
- CAMBium**, a secretion which takes place in the spring, forming a mucous viscid layer, which becomes gradually organized, and ultimately separates into two layers.
- CAMPANULATUS**, bell-shaped, which see.
- CANALICULATUS**, channeled, or deeply furrowed.
- CANDIDUS**, pure white, as the petals of *Lilum candidum*.
- CANESCENTS**, rather hoary.
- CANUS**, hoary, from a layer of hairs upon a green surface.
- CAPILLUS**, a hair's breadth, the twelfth part of a line.
- CAPITATUS**, headed, suddenly enlarged at the top.
- CAPITULUM**, a little head, a form of inflorescence, in which the flowers are seated upon a receptacle, or enlarged axis.
- CAPSELLA**, a small one seeded dry, membranous or coriaceous pericarp.
- CAPSULE**, (*capsula*, a chest), a one or many celled, many seeded, superior dry, dehiscent seed vessel, proceeding from a compound ovary, and opening by valves, of various construction and position.
- CARINA**, keel, like that of a boat, the two lower petals of papilionaceous flowers, united by their lower margin form the keel or carina.
- CARINATUS**, keeled, formed in the manner of the keel of a boat.
- CARIOPSIS**, (*καρην*, the head, *οψις*, form), a one celled, one seeded, superior indehiscent dry fruit, with a membranous pericarp, cohering inseparably to the seed, as the grains of wheat, barley, &c.
- CARNEUS**, flesh coloured.
- CARNOSUS**, fleshy, firm, thick, juicy.
- CARPEL**, (*καρπος*, fruit), that part of the pistil containing the ovules. Each carpel is a modification of a leaf, the upper surface of which is folded inwards upon its mid-rib, so as to bring its margins together, and usually forms the *placenta*, from which a greater or less number of buds are produced, called in a rudimentary state *ovules*. When two or more carpels are developed, they often adhere together by their sides, and form a compound ovary, and contain several cells, or the sides being absorbed, only one cell.
- CARTILAGINOUS**, hard and tough like cartilage, as the testa of an apple seed.
- CATKIN**. See Amentum.
- CAUDATUS**, tail-pointed, any organ which is long, weak, and slender, like the tail of an animal.
- CAUDEX**, (*a stem*), commonly applied to the trunk of the root.
- CAULINE**, (*caulinus*), arising from the stem.

- CAULIS**, (*stem*), the ascending part of shrubs or herbaceous plants is called a caulis.
- CHAFY**, (*paleaceous*), covered with small membranous scales, resembling the pales of Grasses.
- CILIA**, (*cilium, hair of the eye-lids*), when the hairs are long, and forming a fringe on the margin of anything like the eye-lashes.
- CILIATED**, furnished with marginal hairs, resembling the eye-lashes.
- CINERACEUS**, ash-greyish.
- CINEREUS**, ash-grey.
- CIRCOINATUS**, curled round like the head of a crosier, as the young shoots of some Ferns.
- CIRRHOSUS**, (*cirrhosus*), terminated by a spiral or flexuous filiform appendage, and commonly called a *tendril*.
- CLAVATE**, (*clavatus*), club-shaped, gradually thickened upwards from a slender base.
- CLAW**, (*unguis*), the narrow part at the base of the limb of a petal.
- CLUB-SHAPED**. See Clavate.
- CLUSTERED**, (*aggregatus*), collected into bundles of a roundish figure.
- COB-WEBBED**, (*arachnoides*), covered with white thin slender entangled hairs, resembling the web of a spider.
- COCHLEATE**, (*cochleatus*), twisted in a spiral manner, so as to resemble the convolutions of a snail shell.
- COHERING**, (*coharctus*), the uniting together of homogenous parts.
- COLUMELLA**, the bristle-like axis in the fruit of many mosses, the axis from whence the valves of many carpels separate is called the columella.
- COLUMNA**, when the filaments are combined into a solid body.
- COMA**, empty bracts terminating an inflorescence, and mostly coloured, as in some species of *Salvia*.
- COMB-SHAPED**, (*pectinatus*), leaves with narrow close segments, like a comb.
- COMPOUND**, (*compositus*), anything having various divisions or ramifications, or when several divisions are united to form one whole, as pinnated leaves; the various forms of inflorescence composed of more than one flower.
- COMPRESSED**, (*compressus*), flattened lengthwise.
- CONDUPLICATE**, when the sides are applied parallel to the face of each other.
- CONE**, (*strobilus*), an amentum, the carpella of which are scale-like, spread open, and bear naked seeds. Sometimes the scales are thin, with little cohesion, as in the hop; but generally they are woody, and cohere into an oblong tuberculated mass, as in the Fir tribe, &c.
- CONVERTUS**, crowded closely round each other.
- CONFLUENS**, parts united together into one mass.
- CONFEROID**, like *conferva* or sea-weed.
- CONGLOMERATUS**, the same as clustered.
- CONICAL**, (*conicus*), the figure of a cone.
- CONJUGATE**, (*conjugatus*), paired, when the petiole of a pinnatifid leaf bears one pair of leaflets. *Bijugus*, when it bears two pairs.

trijugus, three pairs; *quadrifugus*, four pairs, &c.; and *multijugus*, when the pairs are very numerous.

CONNATUS, (*connate*), when the bases of two leaves, &c., being opposite are united.

CONNECTIVUM, the connective, that part of the anther which unites the two cells together, which is a continuation of the filament, or connected with it, and is sometimes lengthened into the form of a crest or horn.

CONNIVENS, converging together, having a gradually inward direction.

CONTINUOUS, uninterrupted.

CONTORTED, (*contorta*), a term used in describing the aestivation of leaves or flowers, each piece being oblique in figure, and overlapping its neighbour by one margin, its other margin being in like manner overlapped by that which stands next it.

CONVERGING. See *Connivens*.

CONVOLUTE, (*convoluta*), when one petal is wholly rolled up in another.

COSTA, the mid-rib of a leaf, formed by the continuation of the petiole.

CORDATUS, heart-shaped, resembling the heart in a pack of cards.

CORIACEOUS, leathery, having the consistency of leather.

CORKY, (*suberosus*), having a resemblance to cork.

CORMUS, the dilated base of the stem of some monocotyledenous plants; or it is the whole stem developed under ground, and is coated or solid, in the form of a bulb, as in *Crocus*, *Colchicum*, *Arum*, &c.

CORNEUS, (*horny*), a hard close texture, resembling horn, as the albumen of some seeds.

CORNICULATUS, (*horned*), terminating in a process resembling a horn; if there are two processes *bicornis*, three *tricornis*, &c.

COROLLA, (*corolla*, a *little crown*), that envelope of the flower between the calyx and stamens.

CORONA, a crown, appendages formed at the base of the limb of the petal, in the form of scales, sometimes in the form of a cup, as in *Narcissus*.

CORRUGATUS, wrinkled.

CORTEX. See *Bark*.

CORYMBE, (*κορυμβος*, a *summit* or a *branch*), a form of inflorescence, in which the lower branches or pedicels are elongated, and form a level top with the upper shorter ones.

CORYMBOSE, approaching a corymb.

COTTLEDONS, (*χοτυλιδιον*, a *hollow vessel*), the seed lobes.

CRASSUS, thick, anything having a thicker texture than usual.

CRENATE, cut into rounded teeth.

CRENATED, (*crenatus*), having rounded teeth; when these teeth are themselves crenated, *bi-crenate*.

CRESCENT-SHAPED, (*lunatus*), resembling the figure of a crescent or half moon.

CRESTED, (*cristatus*), having an irregular or notched elevated ridge, resembling the crest of an helmet.

CRETACEOUS, chalky, a dull greyish white.

CRISPUS, curled, having the margin very irregularly divided and twisted.

- CRISTATUS.** See Crested.
- CROWNING,** (*coronatus*), situated on the top of anything, as the calyx on the top of the ovary, the style on the capsule, &c.
- CRIBRIFORM,** riddled with holes like a sieve.
- CRUCIATE,** shaped like a cross, a flower with four sepals placed opposite to each other at right angles are said to be cruciate.
- CRUSTACEOUS,** (*crustaceus*), hard, thin, brittle.
- CUCULLATUS,** hooded, a plane body, having the end or sides curved inwards, so as to resemble the point of a slipper, or hood of a monk's cloak.
- CULMUS,** a culm, the stem of grasses.
- CUNEATUS,** wedge-shaped.
- CUPULA,** a cup formed by the union of bracts, so as to form a kind of cup as at the base of the fruit of the oak, nut, &c.
- CUP-SHAPED,** (*cyathiformis*), resembling a drinking cup.
- CURLED** See Crispus.
- CUSPIDATE,** (*cuspidatus*), tapering gradually into a rigid point.
- CUT,** (*incisus*), regularly divided by deep incisions.
- CUTICLE,** (*cuticula*), the outer layer of the bark of plants, frequently called *epidermis*.
- CYATHIFORMIS.** See Cup-shaped.
- CYLINDRICAL,** (*cylindricus*), having nearly the form of a true cylinder.
- CYME,** (*cyma*, a branch or sprout), a form of inflorescence, in which the branches arise from the axis of opposite or whorled bracts or leaves, as the alder, &c.
- CYMOSE,** flowering in cymes.

D.

- DECANDROUS,** having ten stamens.
- DECIDUOUS,** (*deciduus*, liable to fall), finally falling off. Trees which shed their leaves annually, are said to be deciduous.
- DECLINATUS,** inclined downwards.
- DECOMPOSITUS,** decompound, having various compound divisions.
- DECUMBENT,** (*decumbens*), reclining upon the earth, and rising again from it at the apex.
- DECURRENT,** (*decurre*, to run down), prolonged below the point of insertion as the base of many leaves run down the stem.
- DECUSSATE,** (*decussatus*), arranged in pairs that alternately cross each other.
- DEFLEXED,** deflexus, bent downwards.
- DEHISCENS,** gaping, dehiscence; when a pericarp divides spontaneously in a definite manner it is said to be *dehiscent*, its line of division the *suture*, and the separate parts are the *valves*; when the division takes place at the adhering edges of the carpels it is said to be *septicidal*; and when it is midway, that is, in the situation of the mid-rib or nerve of each carpel, *loculicidal*; and if the dissepiments are separated from the valves, the dehiscence is named *septifragal*.
- DELTOID,** (*deltoides*), trowel-shaped, a solid, the transverse section of which has a triangular outline.

- DENTATUS**, toothed, having short teeth, with concave edges; when these teeth are themselves toothed it is said to be *duplicato-dentate*, or doubly toothed.
- DENUDATUS**, naked, free from hairiness, down, &c.
- DEPENDENS**, hanging down, having a downward direction.
- DEPRESSED** (*depressus*), growing horizontally.
- DIADELPHOUS** (*dis*, twice; *αδελφος*, a brother); when filaments are comprised in two sets.
- DICHOTOMOUS** (*διχοτομος*, divided in two, having the divisions always in pairs.
- DICOTYLEDONES** (*dis*, twice; *χτυλαδων*, a seed leaf); seeds having two lobes.
- DIDYMUS** (*διδυμος*, double), growing in pairs, or divided into equal parts, as fruit of *Galium*.
- DIDYNAMOUS**, plants with four stamens, two longer than the others.
- DIFFUSE** (*diffusus*), spreading widely.
- DIGITATUS**, fingered leaves with five deep narrow segments, like the fingers of the hand.
- DIPTERUS**, two winged.
- DISCOIDE** (*discoides*), orbicular, with some perceptible thickness, parallel faces, and a rounded border.
- DISK**, bodies mostly of a glandular nature, situated between the base of the stamens and the ovary, but not forming a part of either.
- DISSEPIMENT** (*dissepio*, to separate), the partitions in ovaries that are formed by the united sides of cohering carpels, and which divide them into cells.
- DISTICHUS**, when things are arranged in two rows the one opposite the other.
- DIVARICATING**, growing in a straggling manner.
- DORSAL** (*dorsalis*), fixed upon the back of anything.
- DOUBLY TOOTHED**. See *dentatus*.
- DOWNY** (*pubescens*), covered with very short weak dense hairs.
- DRUPACEOUS**, fruit with an indehiscent pericarpium, fleshy externally, bony internally.
- DRUPE** (*drupa*, unripe olives), the same as drupaceous.
- DUCTS** (*ductus*, a pipe for water), are membranous tubes, with conical or rounded extremities, forming a part of the vascular tissue of plants; their sides are marked with transverse lines, or rings, or bars, and are not capable of being unrolled without breaking, as the spiral vessels are.
- DUPPLICATO-DENTATE**. See *dentate*.
- DUPPLICATO-SERRATE**. See *serrate*.
- DURAMEN** (*α*, hardening), the heart wood, the inner layers of wood become harder and a darker colour from age.
- DWARF** (*nanus*), small, short, dense, as compared with other species of the same genus or family.

E.

- EARED** (*auriculatus*), having two small rounded lobes at the base.
- ECHINATUS**, bristly, furnished with numerous rigid hairs or straight prickles.

- EGG-SHAPED** (*ovalus*), ovate, the shape of an egg.
- ELLIPTICUS**, oval, elliptical, acute at each end.
- EMBRACING** (*amplectans*), clasping with the base.
- EMARGINATE** (*emarginatus*), notched at the end.
- EMBRYO** (εμβρυον, the fœtus), a fleshy body, occupying the interior of the seed, and constituting the rudiment of a future plant.
- ENDOCARP** (ενδο-, within; καρπος, the fruit); the inner skin of the pericarp.
- ENDOGENÆ** (ενδον, within; γεινομαι, to beget); one of the great divisions of plants, having the stem without distinct layers of bark, wood, or pith, as in exogenous plants, but the whole cellular system is a uniform mass, in which is imbedded the vascular system in the form of thick fibrous bundles, consisting of woody tissue, enclosing spiral or other vessels, and increasing in size from central formations, and not by internal layers; the seeds which they produce are formed of one lobe, not two.
- ENDOTHECIUM** (ενδο-, within; θηκη, a case); the lining membrane of anthers.
- ENSIFORM**, sword-shaped, quite straight, with an acute point.
- ENTANGLED** (*intricatus*), when roots, branches, &c., are so entangled and intermixed together that they cannot be readily separated.
- ENTIRE** (*integer*), without any kind of marginal divisions.
- EPICARP** (επι-, upon; καρπος, fruit); the outer skin of the fruit.
- EPIDERMIS** (επιδερμις, the skin); the external layer of the skin.
- EPIGEUS**, growing close upon the earth.
- EPIGONIUM** (επι-, upon; γονη, offspring); a membranous bag, enclosing the conceptacles of Hepatic plants.
- EPIGYNOUS** (επι-, upon; γυνη, a woman); growing upon the summit of the ovarium.
- EPIPHYLLUS** (επι-, upon; φυλλον, leaf); inserted upon the leaf.
- EQUALLY PINNATE** (*pari-pinnatus*, abrupte-pinnatus), when the common petiole is not terminated by either a leaflet or tendril.
- EQUITANT** (*equito*, to ride), when leaves overlap each other entirely without any involution, as the leaves of the Iris.
- ERECT** (*erectus*), pointing towards the zenith.
- EROSUS** (gnawed), the margin irregularly toothed, as if eaten away by an animal.
- ESTIVATION**, a term used for unexpanded flowers.
- EVEN**, the surface without inequalities.
- EVERGREEN**, plants having perennial or persistent leaves, viz remaining upon the plant beyond a single season, as the Laurel, Ilex, &c.
- EXCURRENT** (*excurrent*), in which the axis remains always in the centre, all the other parts being regularly disposed round it, as the stem of Pinus Abies.
- EXOGENOUS** (εξω, without; γεινομαι, to beget); one of the great divisions of plants, having distinct layers of pith, wood, and bark, and increasing in size by layers external to the old ones; the seeds have two, not one lobe.
- EXTRORSUS**, turned outwards.

F.

- FADING** (*marcescens*), withering, not falling off until the part which bears it is perfected, but withering long before that time.
- FALCATE** (*falcatus*), plane and curved, with parallel edges like the blade of a reaper's sickle.
- FAN-SHAPED** (*flabelliformis*), plaited, like the rays of a fan.
- FARINACEOUS**, (farina meal), formed of meal-like powder, as the albumen of wheat.
- FASCICLED** (*fusculus*, a bundle), when several similar things proceed from a common point as the leaves of the Larch.
- FASTIGIATE** (*fastigiatus*), when all the parts are nearly parallel and pointing upwards, as the branches of many trees.
- FAUX**, the throat or orifice of a monopetalous corolla.
- FAVOSUS**, honey-combed, excavated in the manner of a honey-comb, as the receptacle of some of the compound flowers, &c.
- FEATHERY** (*plumosus*), long hairs or bristles, which are themselves hairy, as the awn of *stipa pennata*, the pappus of various compound flowers, &c.
- FERRUGINEUS**, rusty, a brownish red colour.
- FIBROUS**, composed of numerous fibres.
- FIDDLE-SHAPED**, (*panduratus*, *panduriformis*), obovate, with a deep recess or sinus on each side.
- FILAMENT**, (*filum*, a thread), that part which supports the anther.
- FILIFORMIS**, thread-shaped, slender, like a thread.
- FIMBRIATUS**, fringed, long filiform processes on the margin.
- FINGERED**. See digitatus.
- FISSUS**, split, divided nearly to the base into a determinate number of segments.
- FISTULOSUS**, fistulous, a cylindrical tube, closed at one end, as the leaves of some *Alliums*.
- FLABELLIFORMIS**, fan-shaped.
- FLAGELLIFORMIS**, whip-shaped, long, tape-like, as the thong of a whip.
- FLAVESCENTS**, pale yellow.
- FLESHY** (*carnosus*), firm, juicy, easily cut.
- FLEXUOUS**, having a gently bending direction inwards and outwards.
- FLOATING** (*fluitans*), floating upon the surface of water.
- FLOCCOSE** (*floccosus*), covered with dense hairs like tufts of wool.
- FLORETS**, the small flowers forming the head of compound flowers, those of the disk or middle of the head are often of a different form from those of the ray or circumference.
- FLOWER** is a terminal head, enclosing the organs of reproduction.
- FLUITANS**. See floating.
- FOLIACIOUS**, leaf-like, having the texture and form of a leaf.
- FOLIUM BI-PINNATUM**, } when the leaflets of compound leaves are sub-
 TRI-PINNATUM, } divided into other leaflets.
- FOLLICULE DOUBLE** (*conceptaculum*), a two celled, many seeded, superior, fruit separating into two portions, the seeds of which do not adhere to marginal placentæ, as in the folliculus, to which this closely approaches, but are separate from their placentæ, and lie loose in the cavity of each cell.

- FOLICULUS**, a one celled, one or many seeded, one valved superior fruit, dehiscent by a suture along its face, and bearing its seed at the base or on each margin of the suture.
- FORAMEN** (a hole), the opening in the testæ of ovules.
- FORKED** (*furcatus*), having long terminal lobes like the prongs of a fork.
- FRINGED**. See *fimbriatus*.
- FROND** (frons or leaf), a leafy expansion, bearing fruit at the back, as the frond of ferns, &c.
- FROSTED** (*pruinosis*), an appearance like congealed dew drops upon the surface of leaves, &c.
- FRUCTUS SUPERUS**, fruit having the pericarp adhering to the calyx is called superior.
- FRUCTUS INFERUS**, fruit not having the pericarp adhering to the calyx is called inferior.
- FRUIT** is the ovary or pistil arrived at maturity.
- **AGGREGATE**, ovaria simple, more than a single series produced by each flower, as *Ranunculus*, *Rosa*, &c.
- **COLLECTIVE**, the floral envelopes thickened, enclosing the pericarps as *Salsola*, *Taxus*, *Pinus*, &c.
- **COMPOUND**, ovaria compound, as *Wheat*, *Euphorbia*, *Malva*, *Digitalis*, &c.
- **SIMPLE**, ovaria simple, a single series, only produced by a single flower, as *Borago*, *Plumb*, *Pæonia*, &c.
- FRUTEX**, a shrub.
- FUGACIOUS** (*fugax*), falling off, or perishing very rapidly.
- FUNGIFORMIS**, mushroom-shaped, cylindrical, having a rounded convex overhanging head.
- FUNICULUS** (a little rope), the cord by which the ovules are attached to the placenta.
- FUNNEL SHAPED** (*inundibuliformis*), an obconical tube, gradually enlarging upward into a limb, so that the whole resembles a funnel.
- FURCATUS**, forked.
- FURROWED** (*sulcatus*), marked by longitudinal channels, as the stem of many umbellate plants.
- FUSIFORMIS**, spindle-shaped, thick, tapering to each end.
- FUSOUS**, brown, with a greyish or blackish tinge.

G.

- GALEA**, an helmet, the upper lip of the corolla of labiate plants.
- GAMOSEPALOUS**, (*γάμος*, marriage; *sepalum*, a sepal); a calyx having the sepals united by their edges into a kind of tube or cup; it is often called a *monophyllous* calyx.
- GAMOPETALOUS** (*γάμος*, marriage; *πέταλον*, a leaf); a corolla, having the petals united by their edges into a tube or cup; it is often called *monopetalous*.
- GELATINOUS**, having the texture and appearance of jelly.
- GEMMA**, leafed buds, the rudiments of young branches.
- GEMMULE**. See *plumule*.
- GENICULATUS**, knee jointed, bent abruptly, like the knee joint, as the stem of some grasses.

GERMEN, or **OVARY**, a hollow case at the base of the pistil, which becomes the fruit, and is always one or more celled, enclosing the ovules.

GERMINATION, the revival of the embryo from its torpid state, the growth of the seed, until the embryo has absorbed all the nutriment prepared for it in the cotyledons in the period of germination.

GIBBOUS, very convex or tumid.

GILLS, the *Hymenium*, of *Agaricus*, the lamellæ on which the sporules lie in the fungus tribe.

GLABROUS, smooth.

GLADIATUS, sword-shaped.

GLANDULAR (*glandulosus*), covered with hairs, bearing glands on the apex.

GLANDS, collections of firm cellular tissue, secreting peculiar fluids, they are stalked and simple, or compound, or sessile, frequently called *warts*, and there are *lenticular* glands, brown oval spots common upon the bark of many plants.

GLANS (an acorn), a one celled, one or few seeded, inferior, indehiscent, hard, dry fruit, proceeding from an ovary, containing several cells and several seeds, all of which are abortive but one or two; seated in that kind of persistent involucre called a cupule. Sometimes the gland is solitary and naked above, as in the common oak, or it is entirely enclosed in the cupule, as in the common beech and sweet chestnut.

GLAUCCUS (*glaucus*), covered with a fine bloom, like a cabbage leaf, sea green.

GLOBOSE (*globosus*), forming nearly a true sphere.

GLUMA (a husk of corn), the exterior covering in the florets of grasses.

GLUMELLA, the second covering or corolla of the florets of grasses or glumaceous plants.

GLUMELLULES, the innermost scales of the florets of glumaceous plants.

GLUTINOSUS, viscid, covered with a glutinous exudation.

GNAWED (*erosus*). See *erosus*.

GRANULAR (*granulatus*), divided into little knobs or knots, as on the roots of *Saxifraga granulata*, &c.

GRUMOUS (*grumosus*), clusters of little grains.

GUM, a natural exudation from some trees; it is soluble in water, but is insoluble in alcohol, ether, and oil.

GUTTATUS, spotted.

GYRATUS, the same as circinate.

GYNANDROUS, having the stamens and style combined in one body, as orchises.

H.

HALBERT-HEADED (*hastatus*), abruptly enlarged at the base into two acute lobes, diverging so as to form a halbert-shape.

HALF-TRETE (*semiteres*), flat on one side, round or terete on the other.

HALVED (*dimidiatus*), one half or partially formed; the name given to a leaf, anther, &c., when only one half is perfected.

HAIR-POINTED (*piliferous*), terminating in a very fine weak hair-like point.

HAIR-SHAPED (*capillaris*), resembling a hair.

HAIR, minute transparent filiform processes, composed of cellular tissue in a single row, and more or less elongated; hairs vary greatly in length, density, rigidity, and are either quite simple or various, branched or divided.

HAIRY (*pilosus*), covered with short weak thin hairs.

HASTATUS. See halbert-shaped.

HEADED. See capitatus.

HEART-SHAPED. See cordatus.

HEART-WOOD. See duramen.

HELMET. See Galea.

HEPATICUS, liver coloured.

HERBACEOUS (*herbaceus*), thin, green, cellular, not hard and woody.

HILUM, the end of the seed by which it is attached to the placenta.

HIRSUTUS, hairiness, when the hairs are rather long and rigid.

HIRTUS, shaggy, covered with long weak hairs.

HISPID (*hispidus*), covered with long rigid hairs.

HOARY (*incanus*), covered with very short dense hairs, so close together as to give a whiteness to the surface.

HONEY-COMBED. See favosus.

HOODED. See cucullatus.

HOOKED (*uncinatus*), curved suddenly back at the point.

HORIZONTAL (*horizontalis*), when the plane is towards the heavens and the apex points towards the horizon.

HORNED (*cornutus*, *corniculatus*), terminating in a process resembling a horn.

HORNY. See corneus.

HUMILIS, low, when a plant is much smaller than others of the same genus.

HUMIFUSUS, procumbent, spreading over the surface of the ground.

HYMENIUM, that part of a fungus on which the sporules lie.

HYPOCRATERIFORMIS, salver-shaped, a calyx or corolla, or other organ, the tube of which is long and slender, and the limb flat.

HYPOGYNUS, (*υπο*, beneath; *γυν*, a woman); growing from below the base of the ovarium.

HYPOTHECIUM, the substance that surrounds, or overlies the perithecium in Lichens.

HYSTERANTHOS, when leaves appear after the flowers.

I.

IMBRICATED (*imbricata*), when leaves overlap each other at the margins, like tiles without any involution.

IMPARI-PINNATUS, pinnate, with the petiole terminating in a tendril or single leaflet.

INCANUS. See hoary.

INCISUS, cut, regularly divided by deep incisions.

INCURVUS, inflexed, suddenly bent backwards.

INDEHISCENT (in, not, dehiscens cleaving open), fruit having its pericarp, always remaining closed as the nut.

INDUPLICATE (*induplicativa*), buds having the margins of the leaves or petals bent abruptly inwards, and the external face of their edges applied to each other, without any twisting.

- INDUSIUM**, or involucre, that portion of the epidermis, pushed up by the thecae of Ferns, and afterwards shrinks up or splits into filaments.
- INCRUNIS**, unarmed, destitute of any kind of spines or prickles.
- INFERIOR**, the calyx being distinct from the ovary is said to be inferior, and the ovary superior.
- INFLATUS**, bladdery, thin, membranous, somewhat transparent, equally swelling, as if inflated with air.
- INFLEXED**, suddenly bent inwards.
- INFLORESCENCE**, a term used to express the arrangement of flowers upon a branch or stem.
- INFUNDIBULIS**. See funnel-shaped.
- INFUNDIBULIFORMIS**. See funnel-shaped.
- INSERTION**, the manner in which one part is inserted into or adheres to another.
- INNATUS**, innate, adhering to the apex.
- INTEGER**, entire.
- INTEGERRIMUS**, quite entire, perfectly free from any division.
- INTERNODE**, the space between two nodes or joints.
- INTERRUPTUS**, interrupted, when the symmetrical arrangement of any part is broken; a spike is interrupted when some part of it is without flowers, a leaf interruptedly pinnated when some of the pinnae are much smaller than the others, or are wanting.
- INTERRUPTEDLY PINNATE**, when some of the leaflets are smaller than another in a pinnate leaf.
- INTRICATUS**. See entangled.
- INTRACURVUS**, suddenly bent inwards.
- INTRORSUS**, turned inwards.
- INVERTED** (*inversus*), having the apex of one thing in an opposite direction to that of another.
- INVOLUCELLUM**, or partial involucre, the bracts or scales surrounding the small umbellules of umbellate plants.
- INVOLUCRE** (*involve*, to wrap in,) whorls of bracts, which surround several flowers, and when they surround the general umbel of umbellate plants are called the universal umbel.
- INVOLUTE**, when the edges are rolled inwards, spirally on each side, as the leaf of the apple.
- IRREGULAR** (*irregularis*), any part having its symmetry destroyed by some inequality, as the corolla of the violet, sage, pea, &c.

J.

- JOINTED** (*articulatus*), readily separating at the joints, as the rods of Ornithopus, or the appearance of being jointed, as the leaves of some of the Juncuses.
- JUGA** (*jugum*, a yoke,) the opposite leaflets of pinnate leaves is a jugs, when a leaf has only one pair, *unijugum*; two pairs, *bijugum*, &c.
- JUNGERMANNIACEÆ**, a tribe of moss-like plants.

K

KEEL. See *carina*.

KEELED (*carinatus*), in the shape of the keel of a boat, that is a sharp projecting ridge, arising from a flat or concave central rib, as the glumes of grasses.

KIDNEY-SHAPED (*reniformis*), resembling the figure of a kidney.

KNEE-JOINTED (*geniculatus*), bent abruptly like a knee.

KNOTTED (*tortuosus*), a cylindrical body, with an uneven surface, as the pod of *Chelidonium*.

L

LABELLUM, the lower lip of irregular flowers, as the *Oreihises*.

LABIATE (*labium*, a lip), a term used to designate a monopetalous calyx or corolla, which is unequally divided into two parts, mostly called two lipped or bi-labiate.

LABIOSE, a corolla, resembling the labiate.

LACERNA (a hollow place), air cells, or cavities among the cellular structure of plants.

LACERUS, torn, irregularly divided by deep incisions.

LACINIATED, when leaves are deeply divided.

LACINIATUS, slashed, divided by deep taper-pointed out incisions.

LACUNOSE (*lacunosus*), having numerous large deep depressions or excavations.

LEVIGATUS, polished, having the appearance of a polished surface.

LEVIS, smooth.

LAMELLAR, having two little plates at the point, as the style of many plants.

LAMINA, the thin expanded part of the leaf.

LANATUS, woolly, covered with dense curled matted hairs, resembling wool, as the leaves of *Verbascum Thapsus*, &c.

LANCEOLATE (*lanceolatus*), narrowly elliptical, tapering at each end, as the leaves of *Plantago lanceolatus*, &c.

LATERAL (*lateralis*), fixed on or near the side.

LAXUS, loose, of a soft cellular texture, as the pith of many plants, also when the leaves or branches are widely apart and spreading from each other they are called lax, an open spreading inflorescence with distant branches is lax.

LEAF, consists of two parts, its stalk or petiole, and its blade or lamina.

LEAF BUDS, are the rudiments of young branches, and consist of imbricated scales, surrounding a minute cellular axis or growing point, which is in direct communication with the woody and cellular tissue of the stem.

LEAFLET, the separate leaves of a compound leaf are leaflets.

LEAF-STALK, or petiole, is that part of the leaf which connects the blade with the stem, it is mostly half cylindrical, and often channelled on the upper surface, not unfrequently it is dilated into a leafy expansion, and forms a sheath or vagina, and surrounds the stem, as in the grasses.

LEATHERY. See coriaceous.

- LEGUMEN**, a one celled one or many seeded two valved superior fruit, dehiscing by a suture along both its back and front, and bearing seeds along the inner margin of the neutral suture.
- LEGUMEN LOMENTACEUM**, the same as legumen, except the spaces between each seed being contracted and jointed, and there separating into distinct pieces, as the pod of *Ornithopus*.
- LENTICULARIS**, lens shaped, resembling a double convex lens.
- LEPROUS** (*λεπρός*, *lepros*,) covered with minute scales.
- LICHENS** (*λίχην*, *lichen*,) the name of one of the leafless classes of plants.
- LIGNOSUS**, woody, having the texture of wood.
- LIGULA**, a membranous process at the top of the sheath of grasses.
- LIGULATUS**, strap-shaped, narrow, long, with two opposite parallel margins.
- LIME** or **LAMINA**, is the expanded part of the petal or leaf.
- LINGUIFORMIS**. See tongue-shaped.
- LINIATUS**, lined or striated.
- LINEAR** (*linearis*), narrow, short, with two opposite parallel margins.
- LOBED** (*lobatus*,) partly divided into segments, mostly of a determinate number, *bi-lobed* two lobed, *tri-lobed* three lobed, &c.
- LOCULICIDAL**, when a carpel opens down the middle of each valve.
- LOCUSTA**, or spikelet, the partial inflorescence of grasses.
- LOMENTUM**, the same as *Legumen lomentaceum*.
- LOOSE**. See *laxus*.
- LUNATUS**, crescent-shaped.
- LYCOPODIACEÆ**, a tribe of Cryptogamic plants.
- LYRATUS**, lyre-shaped, obovate, with several sinuses on each side, which gradually diminish in size towards the base.

M.

- MACULATUS**, blotched with irregularly disposed patches of colour.
- MARCESCENS**, withering, or fading before the fruit, &c., is ripe, but remaining attached to it.
- MARGINAL**, fixed upon the edge of anything.
- MARSILEACEÆ**, a tribe of cryptogamic plants.
- MEALY** (*farinosus*), covered with a white scurfy substance like flour.
- MEDULLARY RAYS**, vertical radiating plate of cellular substance, proceeding from the medullar or pith to the cortical part or bark of the plant, and always maintaining a connection between them.
- MEDULLARY SHEATH**, a thin layer of spiral vessels and woody tissue, forming a sheath to the pith.
- MEMBRANACEOUS**, thin, semi-transparent, like a fine membrane.
- MID-RIB**, or **COSTA**, a bundle of vessels more prominent than the other, running from the base to the apex of the leaf.
- MITRIFORM**, the calyptra of mosses, when torn equally all round from its base.
- MONADELPHOUS** (*μονος*, alone, *αδελφός*, a brother,) when the stamens have the filaments united in two sets.
- MOXILIFORMIS** (necklace-shaped,) cylindrical or terete, and contracted at regular intervals.

MONOCARPOUS, bearing fruit but once, and dying after fructification.

MONOCOTYLEDONES (*μονός*, alone, *κοτυλῶν*, a seed leaf,) one of the great divisions of plants, the seeds having but one lobe or cotyledon.

MONOPETALOUS (*μονός*, alone, *πτεῖλον*, a petal,) the same as Gamopetalous.

MONOPHYLLOUS (*μονός*, alone, *φυλλον*, a leaf,) the same as Gamoeepalous.

MUCOSUS, slimy, covered with a slimy secretion, or with a coat that is readily soluble in water and becomes slimy.

MUCRONATE, mucronatus, abruptly terminated by a hard sharp point.

MULTIFIDUS, when the leaves or petals are cut into very numerous segments.

MULTIJUGUS, a pinnatifid leaf, with very numerous pairs of leaflets.

MURICATED (*muricatus*), furnished with numerous short hard excrescences, as the fruit of the *Arbutus unedo*.

N.

NAKED (*nudus*), without down or hairs of any kind.

NAVUS. See dwarf.

NAPIFORMIS, turnip-shaped, the figure of a depressed sphere.

NATANS, swimming, floating under water.

NAVICULARIS, boat-shaped, having the figure of a minute boat, as the glumes of *Phalaris canariensis*.

NECKLACE SHAPED. See moniliformis.

NECTARIUM, small glands at the base of petals, which secrete a honey-like fluid, as in the *Ranunculuses*.

NEEDLE-SHAPED (*acerosus*), linear, rigid, tapering to a fine point from a narrow base.

NERVATUS, ribbed, having several ribs, as the leaves of *Plantago lanceolata*.

NETTED, reticulatus, covered with lines, anastomosing, like the lines of a net.

NITIDUS, shining, having a smooth even polished surface.

NODDING (*nutans*), inclining very much from the perpendicular, so that the apex is directed downwards.

ODULOSE, the fibres of roots having occasional dilatations are said to be nodulose.

NORMAL (*normalis*), a plant having the ordinary structure and form of family or genus to which it belongs, is said to be normal, and abnormal when otherwise formed.

NUCLEUS, a conical mass of cellular structure, invested by two coats, and forming the base or origin of the ovule or young seed.

NUDUS. See naked.

NUT, the same as *Glans*.

NUTANS. See nodding.

O.

OB, prefixed to a word indicates inversion, as *obovate*, inversely ovate; *obcordate*, inversely cordate, &c.

OBLIQUE, when the point or margin of anything is not directly upwards.

OBLONG (*oblongus*), elliptical obtuse at each end.

OBTUSUS, blunt, terminating in a rounded end.

OBVOLUTE, when the margins of one alternately overlap those of that which is opposite to it.

ONE-SIDED (*secundus*), having all the parts by being twisted turned to one side.

OPERCULUM, a lid, the cover over the mouth of the fruit of many mosses, &c.

OPPOSITE (*oppositus*), anything placed opposite to another, as the leaves on the opposite side of the stem, petals from the opposite side of the ovary, branches from the opposite side of the stem, &c.

ORBICULAR (*orbicularis*), perfectly circular.

OSSIS, bony.

OVAL (*ovatis*), elliptical, acute at each end.

OVARY (*ovum*, an egg,) a hollow case formed at the base of the pistil, enclosing the ovules, in one or more cells. When the ovary is below the calyx, corolla, and stamens, it is said to be *inferior*; but when it seems to arise above their insertion it is said to be *superior*.

OVATE (*ovatus*) See egg-shaped.

OVULE, (*ovum*, an egg,) a small semi pellucid pulpy body, borne by the placenta, and gradually developed into a seed.

P.

PAIRED (*conjungatus*) See conjugate.

PALATE, the throat of personate corollas having the lower lip elevated into two longitudinal ridges, with a depression between them is called the palate.

PALMACEOUS. See chaffy.

PALAE, bracts of a thin membranous texture, without colour, scale-like, as on the receptacle of many compound flowers.

PALMATUS, palmate leaves, having five lobes, each having the mid-rib united in a common point at the base.

PANDURIFORMIS. See fiddle-shaped.

PANICLE, a form of inflorescence in which the flowers or spikelets are upon branches of various lengths, as the panicle of grasses.

PAPILLÆ, granular glands.

PAPILIONACEOUS (butterfly shaped), the irregular corolla of most leguminous plants, consisting of five petals, the upper one is more or less erect, more expanded than the rest, and is called the *standard* or *vexillum*, two are lateral oblong, and standing at right angles with the standard, these are called *wings* or *alæ*; the two lower ones are similar in shape to the wings and parallel with them, but cohere by their lower margin, and form the *keel* or *carina*.

PAPPUS (*πappos*), a form of calyx which crowns the seeds chiefly of compound plants, and is in the form of simple or plumose hairs or membranous scales.

- PARASITIC** (*παράσιτος*, one who eats with another,) plants which attach themselves to other plants, and have the power of absorbing their nutriment, and applying it to their own nourishment, as the Cuscuta.
- PARENCHYMA**, the cellular tissue filling up the interstices between the veins of leaves.
- PARIENTAL**, anything arising from the inner lining or wall of anything is said to be parietal.
- PARI-PINNATUS**, equally pinnate when the petiole is terminated without leaflet or tendril.
- PARTED**, divided into segments, which extends to nearly the base of the part to which it belongs; *bi-partitus*, divided into two; *tri-partitus*, into three, &c.
- PARTITIONED** (*loculosus*), divided into cells by internal partitions.
- PATENS**, spreading, having a gradually outward direction.
- PEAR-SHAPED** (*pyriformis*), shaped like a pear.
- PECTINATUS** (*comb shaped*), cut into very numerous close narrow segments, like the teeth of a comb.
- PEDATE** (*pedatus*), cut into palmate lobes, having the two lateral lobes themselves divided into smaller segments, the mid-ribs of which do not run into the same point as the rest, as the leaves of *Helleborus niger*.
- PEDATIFIDUS**, pedate, with the lobes cut in numerous segments.
- PEDICELS**, the ultimate branches of the peduncle which bears the flowers.
- PEDUNCLE**, the branches of an inflorescence.
- PELTATE**, a flat shield, without any elevated border, as the apothecia of some *Lichens*.
- PELTATE** (*peltatus*), the same as umbilicatus.
- PENDULOUS** (*pendulus*), hanging down in consequence of the weakness of its support.
- PEPO**, a one celled many seeded inferior indehiscent fleshy fruit, having the seeds attached to a parietal pulpy placenta, as the Cucumber, Melon, &c.
- PERENNIAL** (*perennis*), lasting for several years.
- PERFOLIATE** (*perfoliatus*), when two opposite leaves are united together at their base, so that the stem appears to pass through the substance of the leaf, as *Chlora perfoliata*.
- PERIANTH** (*περί, around, ἄθος, flower*), a floral covering, when there is only one covering, as the tulip, the perianth is said to be single; when there are two, forming calyx and corolla, it is said to be double.
- PERICARP** (*περί, around, καρπός, fruit*), the covering on the outside of the real integuments of the seeds; in ripe fruit it is extremely diversified in size and texture; the covering which it forms to some seeds is not thicker than a line, and to others more than a foot, and its texture varies from a delicate membrane to the hardness of wood; in many it is dry, in others succulent, &c.
- PERIHYNOUS** (*περί, around, γυνή, a woman*), growing upon some body that surrounds the ovarium.

PERMANENT, the same as persistent.

PERPENDICULAR, being a right angles with some other body.

PERFUSILLUS, very small.

PERSISTENT, remaining when other parts have fallen off, as the calyx of Labiate plants remaining after the corolla is fallen off; also the leaves of evergreen plants are called persistent.

PERSONATE (*persona*, a mask,) ringent, monopetalous corollas, the limb of which is unequally divided, the upper division or lip being arched, the lower prominent, and pressed against it, so that when compressed on its sides it opens, and has some resemblance to the mouth of a gaping animal.

PETAL (πτεῖλος, a leaf,) the envelope of the flower between the calyx and stamens is the corolla, and its divisions are called petals.

PETAL-LIKE (*petaloidous*), having the colour and texture of petals, as the stigma of Iris, and the bractes of many plants.

PETIOLE (*petiolus*, the stalk of fruit,) used in botany for the leaf stalk, and is that part which connects the blade of the leaf with the stem.

PETIOLULES, stalklets, the leaf stalks of the leaflets of compound leaves.

PHYLLUM (Φύλλον, leaf,) used by some botanists instead of sepalum.

PILEUS, the cap or top of an Agaricus, and resembles an umbrella in form.

PILIFERUS, hair pointed, terminating in a fine weak point, as the leaves of many mosses.

PILOUS, hairy, covered with short weak hairs.

PINNATE (*pinnatus*), a compound leaf, having simple leaflets arranged on each side a common petiole.

PINNATE with an odd one (*impari pinnatus*), which see.

PINNATIFID, cut almost to the axis into lateral segments.

PISTIL (*pistillum*), the female system of the flower, which always occupies its centre, and consequently around it all other organs are arranged. It is divided into three parts, the *ovary*, the *style*, and the *stigma*.

PITCHER-SHAPED (*urceolatus*), bell-shaped, with a contracted mouth and erect limb.

PITH, the central column of cellular substance in Exogenous plants, which arises at the point of separation between the root and the stem, (giving out lateral rays in its course, called *medullary rays*, which are in direct communication with the bark,) and terminates in the leaf buds.

PITTED (*acrobiculatus*), anything having small shallow depressions or excavations.)

PLACENTA, any part of the ovary to which the ovules are attached.

PLAITED (*plicata*), folded lengthwise similar to the plaits of a fan.

PLANE, a level or flat surface.

PLUMOSUS. See feathery.

PLUMULE, a minute point at the base of the cotyledons of seeds, which expands by germination into the stem and leaves.

POLISHED (*laevigatus*), having a smooth polished surface.

POLLEN (*fine flour*), the pulverulent substance which fills the cells of the

- anthers, consisting of minute grains, enclosing a fluid containing molecular matter.
- POLYADELPHOUS** (πολύς, many, ἀδελφός, a brother,) when filaments are united into several bundles.
- POLYGARPOUS** (πολύς, many, καρπός, fruit,) trees having the power of bearing fruit many times without perishing.
- POLYPETALOUS** (πολύς, many, πτεῖλον, a leaf,) flowers with several distinct petals.
- POMUM** (an apple), fruit with a fleshy pericarpium, two or more celled, few seeded, inferior, indehiscient; the seeds distinctly enclosed in dry cells, with a bony or cartilaginous lining, formed by the cohesion of several ovaries, with sides of the fleshy tube of a calyx, and sometimes with each other.
- POWDERY** (*pulverulentus*), covered with a fine bloom or powdery matter.
- PRICKLES** (*aculei*), rigid, opaque, processes of a conical shape, terminating in a point.
- PRICKLY** (*aculeatus*), furnished with prickles.
- PRISMATICUS** (prism-shaped), having several longitudinal angles and intermediate flat faces.
- PROCUMBENT** (*procumbens*, *humifusus*), spread over the surface of the ground.
- PROSTRATE** (*prostratus*), lying flat upon the earth, &c.
- PRUINOSUS**, frosted, the surface of anything having the appearance of being covered with congealed drops of moisture.
- PUBENS**, or **PUBESCENTS**, downy, covered with very short weak dense hairs.
- PULVERULENTUS**. See powdery.
- PUMILUS**, dwarf.
- PUNCTATUS**, dotted, covered with minute impressions, as if made by the point of a pin.
- PURGENT** (*purgens*), terminating gradually in a hard sharp point.
- PUSILLUS**, **PERPUSILLUS**, very small as compared with other species of the genus.
- PYRIFORMIS**, pear-shaped.

R.

- RACEMUS** (*racemus*, a bunch,) several flowers arising from a common axis, with each flower upon a partial stalk.
- RACHIS** (ραχίς, the spine of the back,) a peduncle, proceeding in nearly a right line from the base to the apex of the inflorescence.
- RADIANT** (*radiatus*), diverging from a common centre, like rays of a wheel.
- RADICAL** (*radicatus*), arising from the root.
- RADICLE** (*radicula*, a little root,) the lower point of a seed which becomes elongated in germination, and forms the root.
- RADII**, the peduncles of an umbel.
- RAMOSUS**, branched, divided into many branches, and
- RAMULOSUS**, when the branches are very small.
- RECEPTACLE**, the summit of the floral branch or peduncle upon which the carpels are fixed, it is usually flat, and often much dilated.

- RECLINATUS**, reeling, falling gradually back from the perpendicular.
- RECTUS**, straight.
- RECURVUS**, suddenly bent backwards.
- REFLEXED** (*reflexus*), the same as recurvus.
- REGULAR** (*regularis*), when all the parts are symmetrical.
- REMOTUS**, remote, distant.
- RENIFORMIS**, kidney-shaped, resembling the figure of a kidney bean.
- REPAND** (*repandus*), having an uneven slightly sinuous margin.
- RESUPINATE** (*resupinatus*), inverted in position by the twisting of the stalk, as the flowers of the *Orchis* and leaves of the *Ruscus*.
- RETICULATUS**, netted, covered with slightly elevated lines, reticulated like a net.
- RETUSUS**, retuse leaves, &c., terminating in a round end, but depressed in the centre.
- REVOLUTE** (*revolutus*), rolled backwards, as the margin of some leaves, &c.
- RHIZOMA**, (*ρίζωμα*, a root,) root stock, a prostrate thick rooting stem, which yearly produces young branches or plants as the *Iris*.
- RHOMBOID** (*rhombus*), oval, but angular about the middle.
- RIBBED** (*retusus*), having several ribs.
- RINGENT**, or personate, which see.
- ROSACEOUS**, having an arrangement similar to the petals of a single rose.
- ROSTRATUS**, beaked.
- ROSULATE** (*rosulatus*), leaves, &c., so arranged as to resemble the close packed petals of a double rose, as the offsets of *Houseleek*.
- ROTATUS**, wheel-shaped, any organ which has a very short tube and spreading segments, like the corolla of *Veronica* or *Galium*.
- ROOT**, when a seed germinates, that part which descends to bury itself in the earth is the root.
- ROOTSTOCK**. See rhizoma.
- ROTUNDUS**, roundish, orbicular, or slightly oblong.
- RUGOSE** (*rugosus*), covered with netted lines, having convex spaces between them.
- RUNCINATE** (*runcinatus*), leaves having their divisions pointing towards the base of the leaf, as those of the *Taraxacum*.
- RUNNER**, a prostrate filiform stem, putting out roots and a young plant at its extremity, from which also arise other runners, as in the Strawberry.

S.

- SAGITTATUS**. See arrow-headed.
- SALVER-SHAPED**. See *hypocateriformis*.
- SAMARA**, a dry superior indehiscent fruit, two or more celled, the cells few seeded, elongated into wing-like expansions, as the *Ash*, *Maple*, and *Elm*.
- SARCOCARP** (*σαρκίς*, flesh, *καρπός*, fruit,) the fleshy part of fruit between the external integument, or *epicarp*, and the internal, or *endocarp*.
- SAWED** (*serratus*), having sharp straight teeth pointing to the apex, when these teeth are themselves serrated, bi-serrate or duplicato-serrate.

SCABER, rough, covered with short hard points.

SCALE (*squama*), anything which has a scaly appearance, as bracts of a catkin.

SCALY (*squamosus*), covered with minute scales, fixed by one end.

SCAPE, a peduncle arising from the axis of the leaf of a stemless plant, and bearing the flowers at its apex, as the *Clowship*.

SCARIOUS (*scariousus*), having a thin dry shrivelled membranous appearance.

SCATTERED (*sparsum*), without any definite arrangements.

SCIMITAR-SHAPED (*acinaciformis*), thick, curved, plane on the two sides, the concave border thick, the convex border thin.

SCORICULATUS, pitted, the excavations or depressions small shallow.

SCUTATUS, buckler-shaped, having the figure of a small round buckler.

SOUTHELLIFORM (*scutelliformis*), shield-shaped, broad, oval, thick, convex on the lower surface, concave on the upper.

SECUNDUS, one sided, having all the parts by twists in their stalks turned one way.

SEMI-AMPLEXICAULIS, half embracing the stem.

SEPALA (*sepala*), the division of the calyx.

SEPTA, the same as dissepiments.¹

SEPTICIDAL, a form of dehiscence of fruit, when the dissepiments divide into two plates, and form the sides of each valve.

SEPTIFRAGAL, a form of dehiscence of fruit when the dissepiments adhere to the axis, and separate from the valves.

SERIALIS, arranged in rows, which are not necessarily opposite each other.

SERICEUS, when hairs are long, very fine, and close pressed to the surface, so as to present a silky appearance.

SERRATUS. See sawed.

SESSILE, without any sensible stalk, sitting close upon its support.

SETA, bristles, when short and stiff.

SETOSUS, bristly.

SHAGGY (*hirtus, villosus*), covered with long weak hairs.

SHIELD-SHAPED, the same as scutate.

SILICULA, similar to the following, but much smaller.

SILIQUA, a one or two celled many seeded superior linear fruit, dehiscing by two valves, separating from the septum, the seeds are attached to two placentae, adhering to the septum, and opposite to the lobes of the stigma.

SIMPLE, without divisions, or very little divided.

SIMPLICISSIMUS, quite simple, not divided or branched.

SINUATE (*sinuatus*), having an uneven margin, with deep alternate concavities and convexities.

SLASHED. See laciniatus.

SMOOTH (*glaber*), free from any hairs or roughness.

SOLITARY (*solitarius*), growing singly.

SORI, the clusters of reproductive organs of ferns.

SPADIX, a form of inflorescence, in which the flowers are arranged around a fleshy rachis, and inclosed in a kind of bract or spathe.

SPARSUS. See scattered.

SPATHE (*σπάθη*, a ladle,) a large coloured bract, in which the spadix of Palms and Aracæ are enveloped.

- SPATHEULATE** (*spatulatus*), oblong, with the lower end very much attenuated, as the leaf of the common daisy.
- SPHERIOUS**, globose.
- SPIKE**, a form of inflorescence, in which the flowers are sessile along a common axis.
- SPIKELET**, a little spike.
- SPINDLE-SHAPED**. See fuciformis.
- SPINE**, a hardened leaf, bud, or abortive branch.
- SPINOUS**, spiny, furnished with spines.
- SPIRAL** (*spiralis*), arranged in a spiral manner round some common axis, as the flowers of *Spiranthes*.
- SPORULES** (*σπορα*, a seed,) the reproductive organs of cryptogamic plants analogous to the seeds of flowering plants.
- SPREADING**. See patens.
- SPUR**, when a sepal or petal is prolonged backwards into a conical process:
- SQUAMOSUS**, scaly, covered with small scale-like leaves.
- SQUARESUS**, when organs are spread out at right angles, or nearly so, from a common axis.
- STALKLETS**, short footstalks.
- STAMEN**, the male apparatus of the flower consisting of *filament*, *anther*, and *pollen*. Stamens originate from the space between the base of the petals and the base of the ovary.
- STANDARD**, the upper more expanded, usually erect petal, of a *papilionaceous* or butterfly-shaped corolla, often called *vestillum*.
- STARRY** (*stellate*), tufts of hairs diverging from the centre in a star-like manner.
- STEM** (*caulis*), the ascending caudex of herbaceous plants or shrubs, which in trees is called the trunk.
- ARBORIAL.**
- runner*. See runner.
- sucker*, a branch which proceeds from the neck of a plant beneath the surface of the ground, and becomes erect immediately that it emerges from it, producing leaves, branches, and at length roots from its base.
- offset*. See offset.
- rootstock*. See rootstock.
- pseudo bulb*, an enlarged stem, resembling a tuber, from which it differs in being formed above ground, in having an epidermis that is often extremely hard, and in retaining upon its surface the scars of leaves which it once bore.
- STEMLESS**. See caulis.
- STIGMA**, the naked secreting surface at the upper extremity of the style.
- STIPITATE** (*stipitatus*), anything elevated on a stalk, which is neither a petiole or a peduncle.
- STIPULES**, appendages at the base or upon the petioles of the leaves usually on both sides, and are free as in *Roses*, or sheathing the stem, as in *Polygonums*, and are then called *ochrea* by Willdenow.
- STOMATES** (*στομα*, the mouth,) passages through the cuticle of plants which open into cavities in the subjacent cellular tissue.

STRAGGLING (*divaricans*), spreading irregularly.

STRAP-SHAPED. See *ligulatus*.

STRIATUS, striated, marked by longitudinal lines.

STRICTUS, very straight.

STRIGOSE, covered with stiff hairs.

STROBILUS, a cone, or amentum, a form of fruit, the carpels of which are scale-like, spread open, and bear naked seeds, the scales are thin, and scarcely united, or thicker, woody, and cohere into a tuberculated mass, as the fruit of the *pinus*, &c.

STYLE (*στυλος*), the elongation of the ovary which supports the stigma.

SUB, prefixed to a word, signifies *somewhat*, as *sub-viridis*, somewhat green.

SUBMERSED (*submersus*), buried beneath water.

SUBRAMOSUS, somewhat branched.

SUBROTUNDUS, somewhat round.

SUBULATUS, awl-shaped, linear, very narrow, with a broad base, tapering to a very fine point.

SUCCULENT (*succulentus*), very cellular, and juicy.

SUCKER. See *stem*.

SUFFRUTEX, plants having branches of a woody texture, which perish annually.

SULCATUS, furrowed, marked by longitudinal channels.

SUPERIOR, a calyx, &c., which arises or seems to arise from the top of the ovary is said to be superior.

SUSPENDED, when an ovule hangs from a little below the summit.

SUTURAL, a fruit dehiscing without any dissepiments, such as the *Pea*, is called sutural.

SUTURE, the part where the fruit naturally opens.

SWORD-SHAPED. See *ensiform*.

SYNGAROUS, when carpels are united into an undivided body.

T.

TAIL-POINTED. See *candatus*.

TAPER-POINTED. See *acuminatus*.

TENDRIL. See *cirrus*.

TERETE, terete or taper, the opposite of angular.

TERMINAL, anything arising from the end, a flower on the top of a stem is terminal.

TERNATE (*ternatus*), when three things arise from a common axis.

TESSELLATED, colours so arranged as to resemble a tessellated pavement.

TESTA (*testis*, an earthen pot), the integuments of the seed.

TETRADYNAMOUS, flowers having six stamens, four of which are longer than the other, two are so called.

THURIA (*θύρα*, a sheath or case,) the hollow urn, or cup-shaped bodies of cryptogamic plants, which contain the sporules or reproductive organs.

THALAMUS (*θάλαμος*, lodging or store-room,) the receptacle upon which the carpels are seated; it is sometimes called *torus*. It is the

bed of fibres from which many Fungi arise, and is often called *thallus*.

THALLUS, or *thalamus*.

THREAD-SHAPED. See *filiformis*.

THREE DIGITATE-PINNATE (*ternato pinnatus*), when the secondary petioles on the sides of which the leaflets are attached, proceed in threes from the summit of a common petiole.

THROAT (*fusus*), the orifice of the tube of monopetalous corollas.

THYRSUS, a form of inflorescence, in the form of a panicle, but with the lower branches shorter than those of the middle, and the whole very crowded and compact.

TOMENTOSE (*tomentosus*), covered with short dense hairs.

TONGUE-SHAPED (*linguiformis*), long fleshy plano convex, obtuse, as the leaves of the common Houseleek.

TOOTHED. See *dentatus*.

TORN (*lacerus*), irregularly divided by deep incisions.

TORTUOUS (*tortuosus*), having an irregular heading and turning direction.

TORULOSUS. See *knotted*.

TORUS. See *Thalamus*.

TRAPEZIFORM (*trapeziformis*), having four edges, but the opposite ones not being parallel, as the leaves of *Populus nigra*.

TRICHOTOMUS, the branches of a plant, &c., in three.

TRIADELPHOUS, when the filaments arise in three sets or bundles.

TRICORNIS, anything terminating in three processes, resembling horns.

TRIDENTATUS, when a leaf is truncated at the end, and has three teeth.

TRIFIDUS, split into three.

TRIGONUS, three cornered, having three longitudinal angles, and three plain faces.

TRIJUGUS, a leaf having three pairs of leaflets.

TRILOBUS, three lobed.

TRIPARTITIS, divided into three parts.

TRIPINNATUS, tripinnate, leaflets of a bipinnate leaf, which are themselves pinnate.

TRIPTERUS, three winged.

TRIQUETER, three edged.

TRISECTUS, deeply three lobed.

TRISERIALIS, or *TRIVARIAN*, arranged in three rows.

TRITERMATE (*tritermatus*), a leaf having the common petiole divided into three secondary petioles, which are each subdivided into three tertiary petioles, each of which bears three leaflets, as in *Epimedium alpinum*.

TRUMPET-SHAPED (*tubatus*), hollow and dilated at one end, like that of a trumpet.

TRUNCATE (*truncatus*), terminating very abruptly, as though a piece had been cut off.

TRUNCUS, trunk or stem, but used only for the trunk or stem of trees.

TUBATUS. See *trumpet-shaped*.

TUBER, an annual thickened subterranean stem, having lateral buds, from which new plants are produced the succeeding year, as the potato.

TUBERCULATUS, tubercled, covered with little excrescences or warts.

TUBERCULUM, a very small tuber.

TUBULAR (*tubulosus*), a hollow cylindrical figure.

TUNIC, the outer covering of a bulb.

TURBINATE (*turbinatus*), top shaped, inversely conical, with a contraction towards the point.

TURGID (*turgidus*), slightly swelling.

TURNED BACKWARDS (*retroversus*), turned in a direction opposite to that of the apex of the body to which the part turned appertains.

TURNED INWARDS (*introrsus*), turned towards the axis to which it appertains.

U.

UMBEL, a form of inflorescence, in which all the pedicels proceed from a single point, and are of an equal length. If each pedicel bears a single flower it is then called a *simple umbel*; but if each pedicel bears another small umbel at the top it is called the *universal* or *general umbel*, and each of the secondary umbels or umbellules is called a *partial umbel*.

UMBILICAL CORD, the slender prolongation of the placenta, by which the ovule is attached to the ovary.

UMBILICATUS, the same as peltate, that is a leaf, &c., fixed to the stalk by the centre, or by some point within the margin.

UMBILICATUS, the same as *hilum*.

UNARMED (*inermis*), without any kind of spine or prickles.

UNDERSHrub (*suffrutex*.)

UNDULATUS, having the margin alternately concave and convex.

UNEQUAL (*inequalis*), a figure with unequal sides.

UNEQUALLY PINNATED (*imparipinnatum*), when one of the leaflets of a compound leaf terminates the petiole.

UNQUICULATE, a petal, contracted at the base into a claw.

UNQUIS, the claw of a petal.

UNIJUGUS, paired, when the petiole of a pinnated leaf bears one pair of leaflets.

UNILATERALIS (*secundus*), one sided, arranged or turned to one side.

UNINTERRUPTED, continuous, equal.

URCEOLATUS, pitcher-shaped.

URENS, stinging, furnished with sharp stinging hairs, which emit a fluid when pressed upon.

UTRICULUS, a simple fruit, being one celled, one or few seeded, superior, membranous, often dehiscing by a transverse incision.

V.

VAGINATUS, sheathing, a convolute base, surrounding the stem, &c., as the petioles of the leaves of grasses.

VAGUS, uncertain, without any particular direction.

VALVATE (*valvata*), petals before expansion applied to each other by their margins are said to be valvate.

VALVES, the glumes or bracts of grasses are frequently so called.

VEINS, the divisions of the petiole ramifying among the cellular tissue of the leaf.

VELUTINUS, velvety, densely covered with close short hairs like velvet.

VENTRICOSUS. See bellying.

VERNATION, the unexpanded state of the foliage.

circinate, curled round like the head of a crosier, as the young frond of ferns.

conduplicate, when the sides are applied parallelly to the face of each other.

convolute, when one is wholly rolled up in another.

VERrucosus, tuberculated, covered with small warts or excreescences.

VERSATILE (*versatilis*), attached by the middle, so that the two halves are equally balanced, or nearly so.

VERTICAL, perpendicular, being at right angles with some other body.

VEXILLUM. See standard.

VELLOSUS, covered with very long soft straight erect hairs.

VISCID (*viscidus*, or *glutinosus*), covered with a glutinous exudation.

VOLUBILIS, twining, having the property of twisting round some other body.

VERTICILLATUS, whorled, when several things are arranged round a common axis, as the leaves of *Galium*, petals round the ovary, &c.

W.

WARTS. See verrucosus.

WAVY. See undulatus.

WAXY, having the texture and colour of new wax.

WEDGE-SHAPED (*cuneatus*), in the form of a wedge.

WHEEL-SHAPED. See rotatus.

WHIP-SHAPED. See flagelliformis.

WHORLED. See verticillatus.

WINGED (*alatus*), anything having a thin broad margin, as the carpels of many umbellate plants, &c.

WOOLLY. See lanatus.

WRINKLED (*corrugata*), when parts are folded without regularity.

WITHERING. See marcescens.

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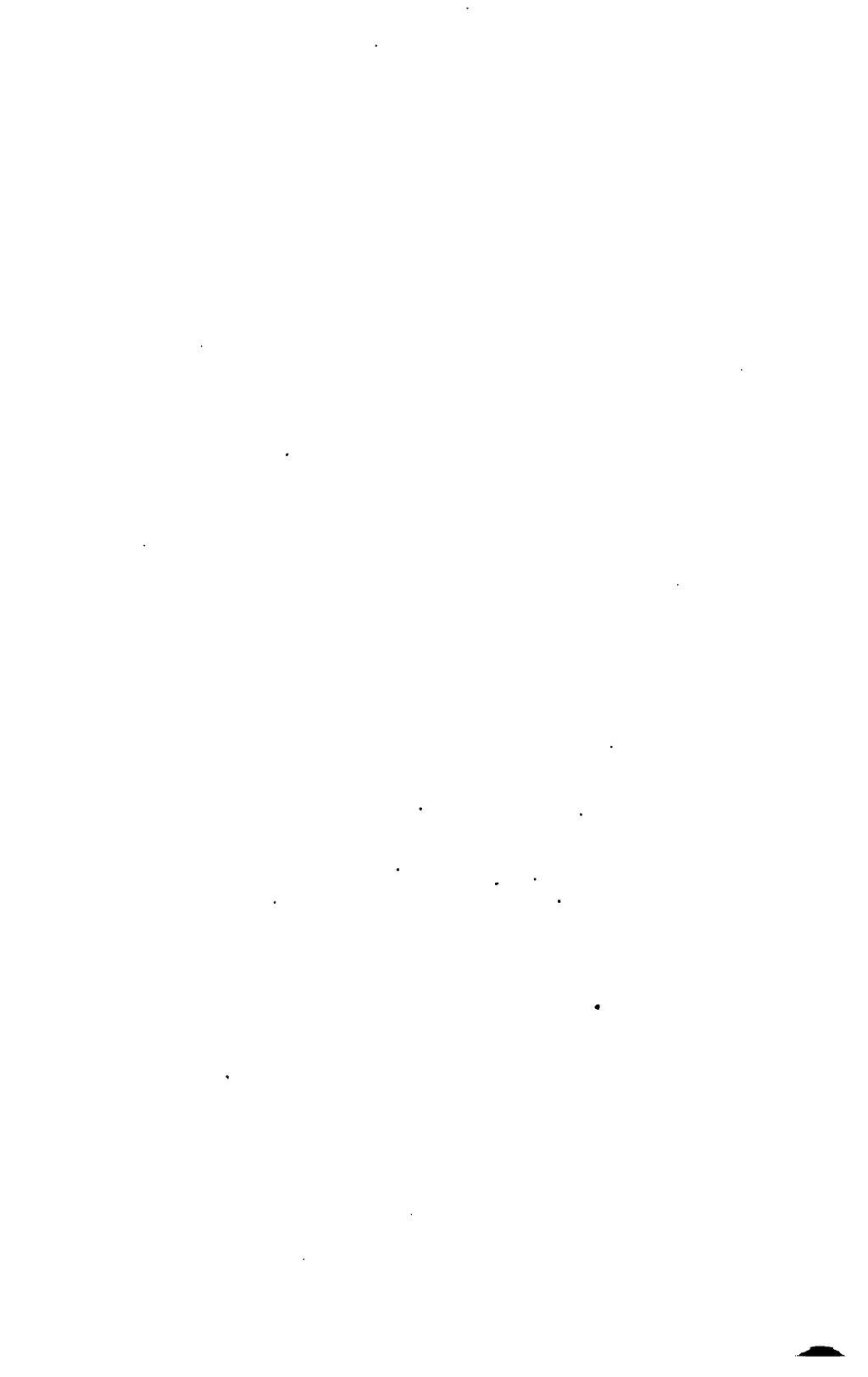
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